DW D-UD123X(S/M) 2010.3.4 4:44 PM 페이지 1

S/M No. :

Service Manual

Drum Washing Machine

Model: DWD-UD123X

✔ **Caution**

: In this Manual, some parts can be changed for improving, their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List) in Service Information Center (http://svc.dwe.co.kr).

DAEWOO ELECTRONICS

Mar. 2010

DRUM WASHING MACHINE SERVICE MANUAL

1. What is Drum? 1

2. Washer Specification 4

3. Operating Mechanism Diagram 6

4. Each Part of Drum Washing Machine 8

5. Parts List By ASS'Y 10

6. Control Part Function Specification 25

7. Electronic Field Parts List and Specification 49

8. Wiring Diagram 76

9. Trouble Shooting Regarding Drain 77

10. Installation 78

11. Attention Point With Servicing 80

1. WHAT IS DRUM Washing Machine?

1. Drum Washing Machine

Water consumption is reduced by using the power of the laundry falling (free-fall) created when rotating the drum. With temperature control system, this drum washing machine saves energy and improves washing performance at the same time.

2. Key Features

◆ Waist Care
Designed by the waist, and the most comfortable angle eject into the laundry is convenient and easy to manipulate.

◆ The World's First Steam White Course
The Steam White Course save more 50 percent of Electricity, Water, Time than previous White Course.

◆ Star Drum
Using Star Drum is able to higher Washing Performance and Minimal damage of laundry, water consumption.

◆ The biggest capacity with compact size
12 Kg Capacity enable to wash bigger laundry.

◆ Sumultaneous supply of cold and hot water
As cold and hot water is supplied at the same time heating time and energy is saved.

◆ Luxury Audio Dial
Using the advanced Audio Dial is luxury design of exterior.

◆ The World's First Shoes Course Enable to wash shoes.

◆ DD inverter motor
The direct-drive type of which motor is directly connected to drum without an interim chuth, significantly reduces noise and vibration.

◆ Self-Cleaning Course of Drum.
Enable to Self-Cleaning of Drum.

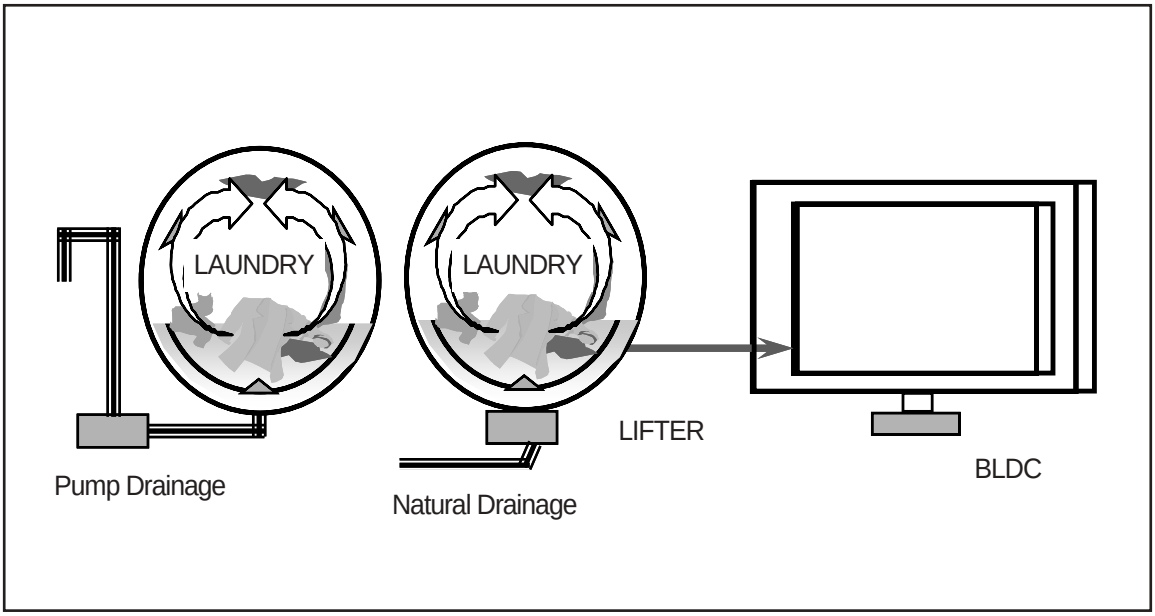
◆ Digital Condensing Dry System.
Condensing Dry System with saveing energy.

◆ For pump drainage, the powerful pump speeds up drainage process.

◆ AUTO DETERGENT SYSTEM
No more prepare detergent before every washing (only liquid detergent and fabric softener)

◆ SMART WASH
you can wash easily like stocking,lingerie use smart wash system

3. Power System



- DD Control: Direct drive type of direct connection between drum and motor
- Rotation by powerful high-performance BLDC motor
- Pump drainage type for built-in installation and Natural drainage

4. Major Functions

① Washing

When rotating drum after putting in the laundry and detergent into the drum, the laundry are rotated by protrusions (lifters) attached inside the drum.

Washing is carried out with bending and impact actions generated by falling of the laundry to the bottom part of drum.

② Rinsing

Rinsing cleanly washes out detergent and dirt removed from the laundry after washing cycle.

③ Spin-drying

Weak, standard and strong spin cycle can be selected according to types of fabrics to be washed. spin-wringing is carried out by rotation (the centrifugal force) of drum according to the designated speed.

④ Drainage

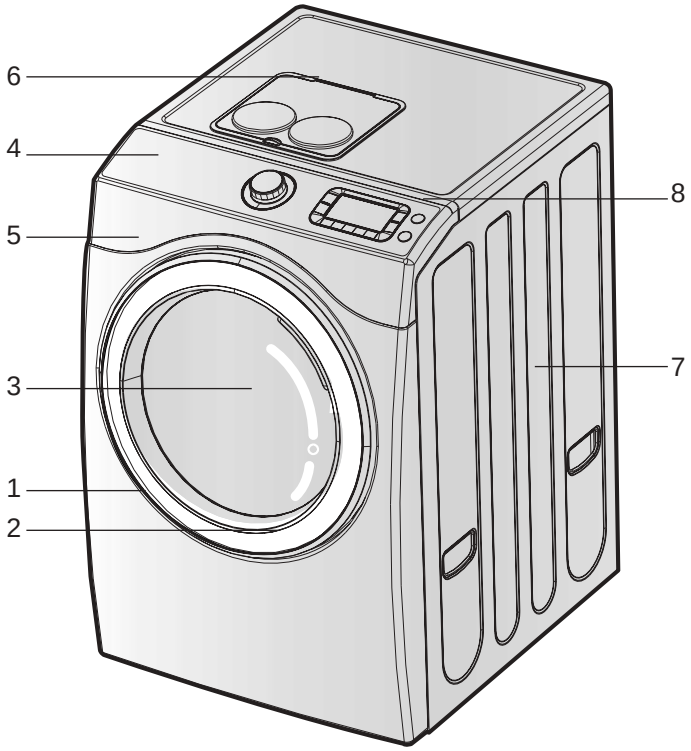
Pump Drainage: Powerful pump for built-in installation and application of filter to remove foreign substances

Natural Drainage: Applied Natural Drainage as the same pullsator.

2. Washer Specification

1. Product Specification

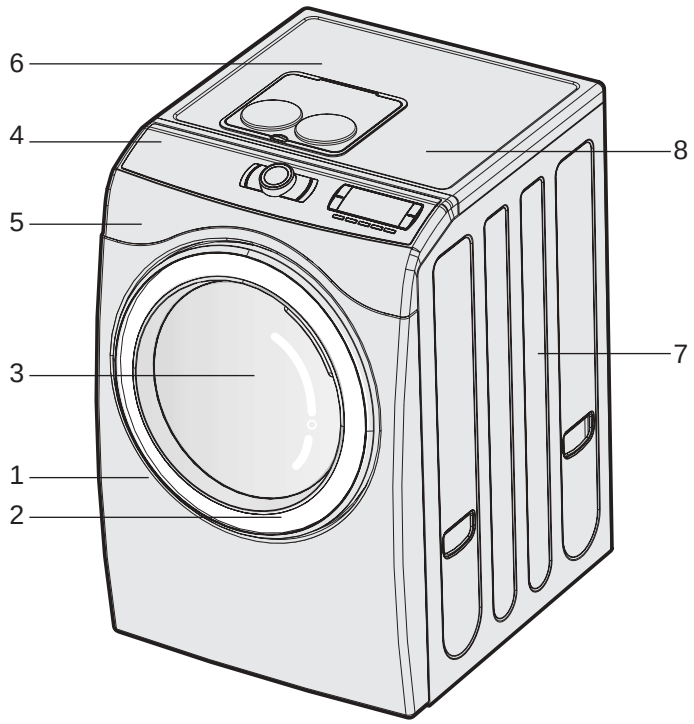
① U129'S SERIES



NO	PARTS NAME
1	CABINET F
2	FRAME DOOR O
3	PROTECT GLASS
4	PANEL F
5	CASE DETERGENT
6	PLATE TOP
7	CABINET
8	BUTTON DIAL

DIMENSION(WxDxH)		630mm(W) x 792mm(D) x 991mm(H)
MACHINE WEIGHT		82 kg
WATER CONSUMPTION		WASH 91 ℓ / DRY 51 ℓ
WASHING CONSUMPTION		31 ℓ
POWER SOURCE		230V/50Hz, 110V/60Hz, 127V/60Hz
POWER CONSUMPTION	WASHING	200W (Heating) ~ 2000W
	DRY	1200W ~ 2100W
CAPACITY	WASHING	12 kg
	SPIN	12 kg
	DRY	7 kg
WASHING TYPE		DRUM TYPE
DRY TYPE		Digital condensing dry system
OPERATION WATER PRESSURE		29kPa ~ 784kPa(0.3kgf/cm^2~8kgf/cm^2)

② U127'S SERIES



NO	PARTS NAME
1	CABINET F
2	FRAME DOOR O
3	PROTECT GLASS
4	PANEL F
5	CASE DETERGENT
6	PLATE TOP
7	CABINET
8	BUTTON DIAL

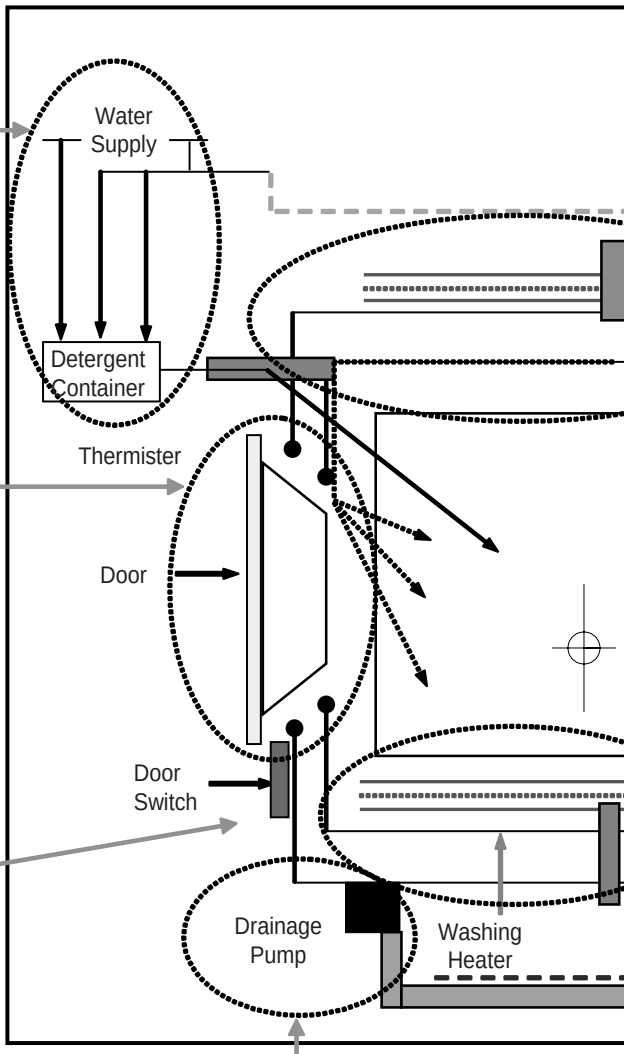
DIMENSION(WxDxH)		630mm(W) x 792mm(D) x 991mm(H)
MACHINE WEIGHT		82 kg
WATER CONSUMPTION		WASH 91 ℓ / DRY 51 ℓ
WASHING CONSUMPTION		31 ℓ
POWER SOURCE		230V/50Hz, 110V/60Hz, 127V/60Hz
POWER CONSUMPTION	WASHING	200W (Heating) ~ 2000W
	DRY	1200W ~ 2100W
CAPACITY	WASHING	12 kg
	SPIN	12 kg
	DRY	7 kg
WASHING TYPE		DRUM TYPE
DRY TYPE		Digital condensing dry system
OPERATION WATER PRESSURE		29kPa ~ 784kPa(0.3kgf/cm^2~8kgf/cm^2)

3. Operating Mechanism Diagram

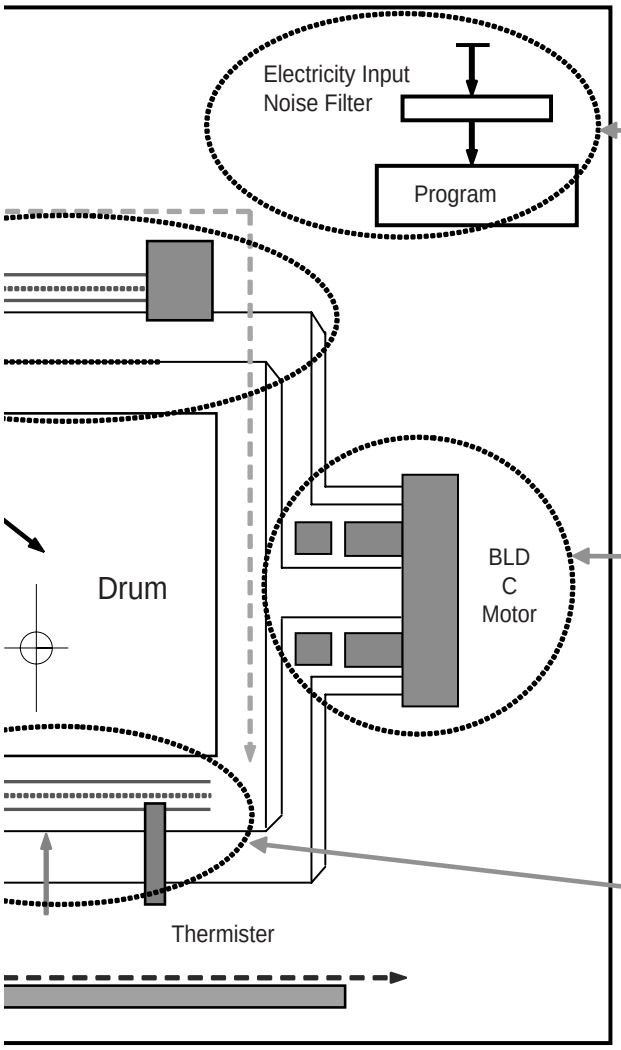
4. WATER SUPPLY PART
- Cold Water: 3 holes
  Cold water, pre-washing
- Hot Water: 1 hole
- Water supply box, hose

6. DRY PARTS
- HEATER DRY : OPTION
- BLOWER FAN
- FAN MOTOR : BLDC
- THERMISTOR
- THERMOSTAT
  : FUSE, BI-METAL
- CONDENSING SYSTEM
- DRY FAN DRIVE
  → GENERATION OF HEATER'S HEAT
  → TEMP. SENSOR
  → 110°C Off 100°C On : OPTION

5. DOOR
- Door lock S/W
- Lock hinge
- Door AS: Glass
- Gasket



7. DRAINAGE PART
- Drainage pump
- Valve housing
- Hose



1. CONTROL PART
- Main PCB
- Front PCB
- Harness
- Noise filter
- Power Cord: 15A

2. DRIVING PART
- BLDC motor
- Drum
- Bearing
- Spider/ shaft
- Tub
- Weight balancer

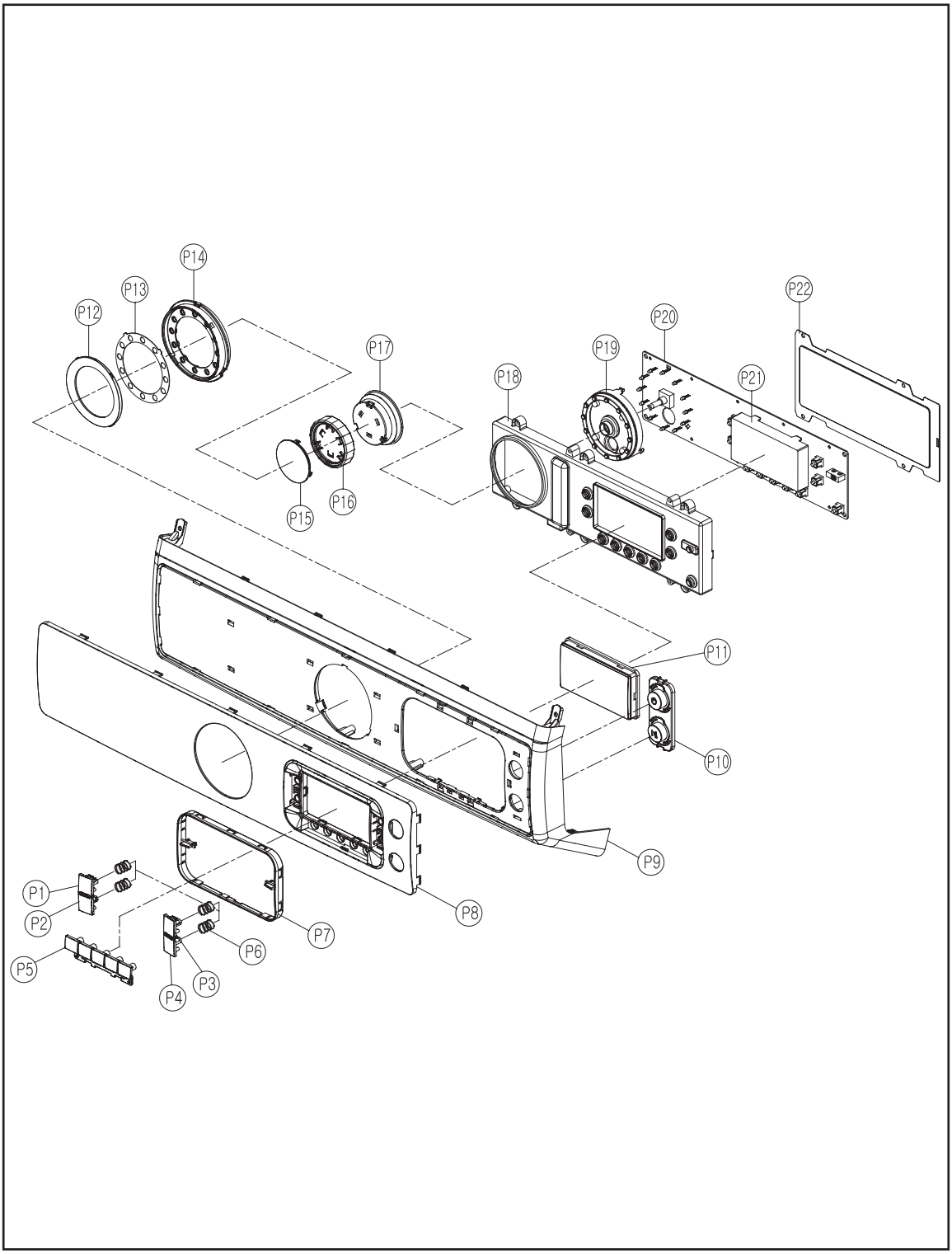
3. HEATING PART
- Water Heater: 1000W ~ 2000W
- Washing temperature sensor

8. SUPPORTER
- DAMPER AS : Front 2(70) / Rear 2(110N)
- Spring : 2

4. Parts list by ass'y

1. PANEL F AS

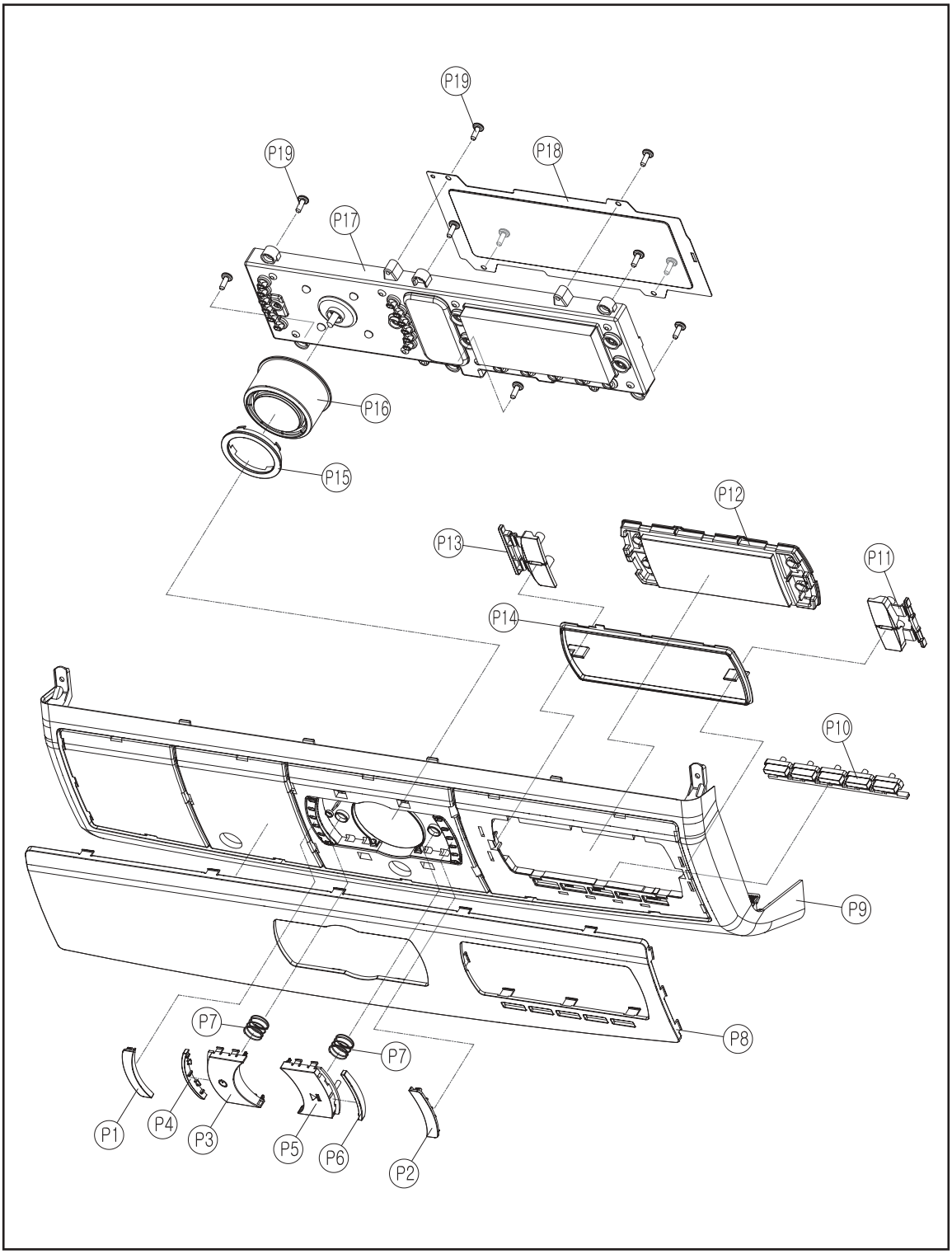
① U129'S series



No	Part Name	Part Code	Description	Qt'y	Remarks
P1	BUTTON LIQUID	3616641600	ABS	1	
P2	BUTTON RES	3616641700	ABS	1	
P3	BUTTON SELECT DETERGENT	3616641800	ABS	1	
P4	BUTTON ADD	3616641900	ABS	1	
P5	BUTTON FUNCTION	3616643200	ABS	1	
P6	SPRING BUTTON	3615116300	SUS, ID=9.5,d=0.5,L=15	4	
P7	DECORATOR WINDOW DISPLAY	3611692700	ABS	1	
P8	PANEL INNER	36142T1G00	ABS	1	
P9	PANEL OUTER	36142T1F00	ABS	1	
P10	BUTTON PS	3616641500	ABS	1	
P11	WINDOW DISPLAY	3615508400	투명 ABS	1	
P12	WINDOW COURSE	3615508500	투명 ABS	1	
P13	DECORATOR FILM COURSE			1	
P14	DECORATOR WINDOW COURSE	3611692800	ABS	1	
P15	DECORATOR BUTTON DIAL	3611692900	ABS	1	
P16	BUTTON DIAL OUTER	3616643700	ABS	1	
P17	BUTTON DIAL INNER	3616642500	ABS	1	
P18	CASE PCB F	36111T1G00	HIPS	1	
P19	HOLDER LED COURSE	3613057100	HIPS	1	
P20	PCB ASS'Y			1	
P21	CUSTOM LED			1	
P22	PROTECTOR PCB	3618345400	SECC 0.6t	1	
P19	SCREW TAPPING		T2 TRS 4x14	10	

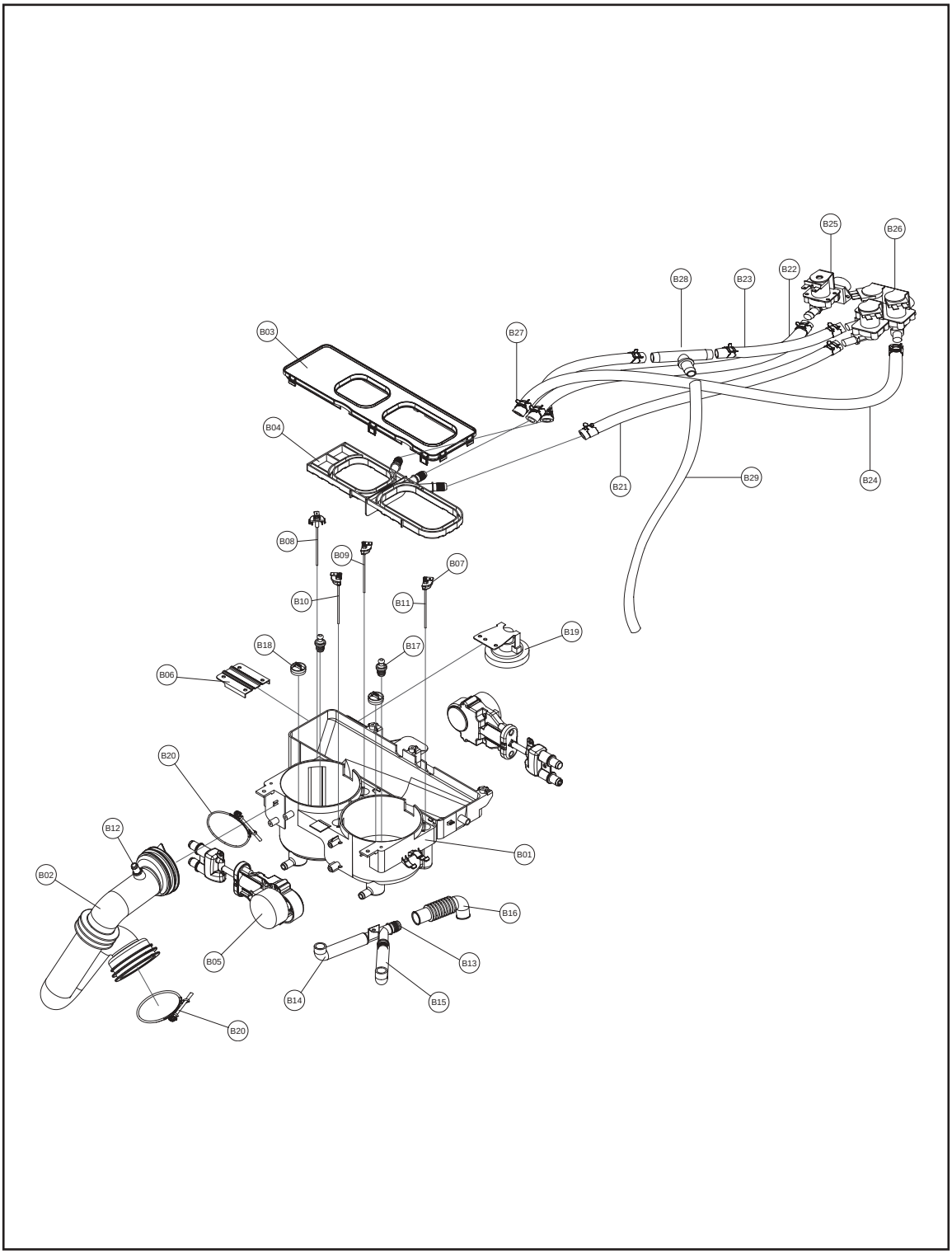
1. PANEL F AS

② U127'S series



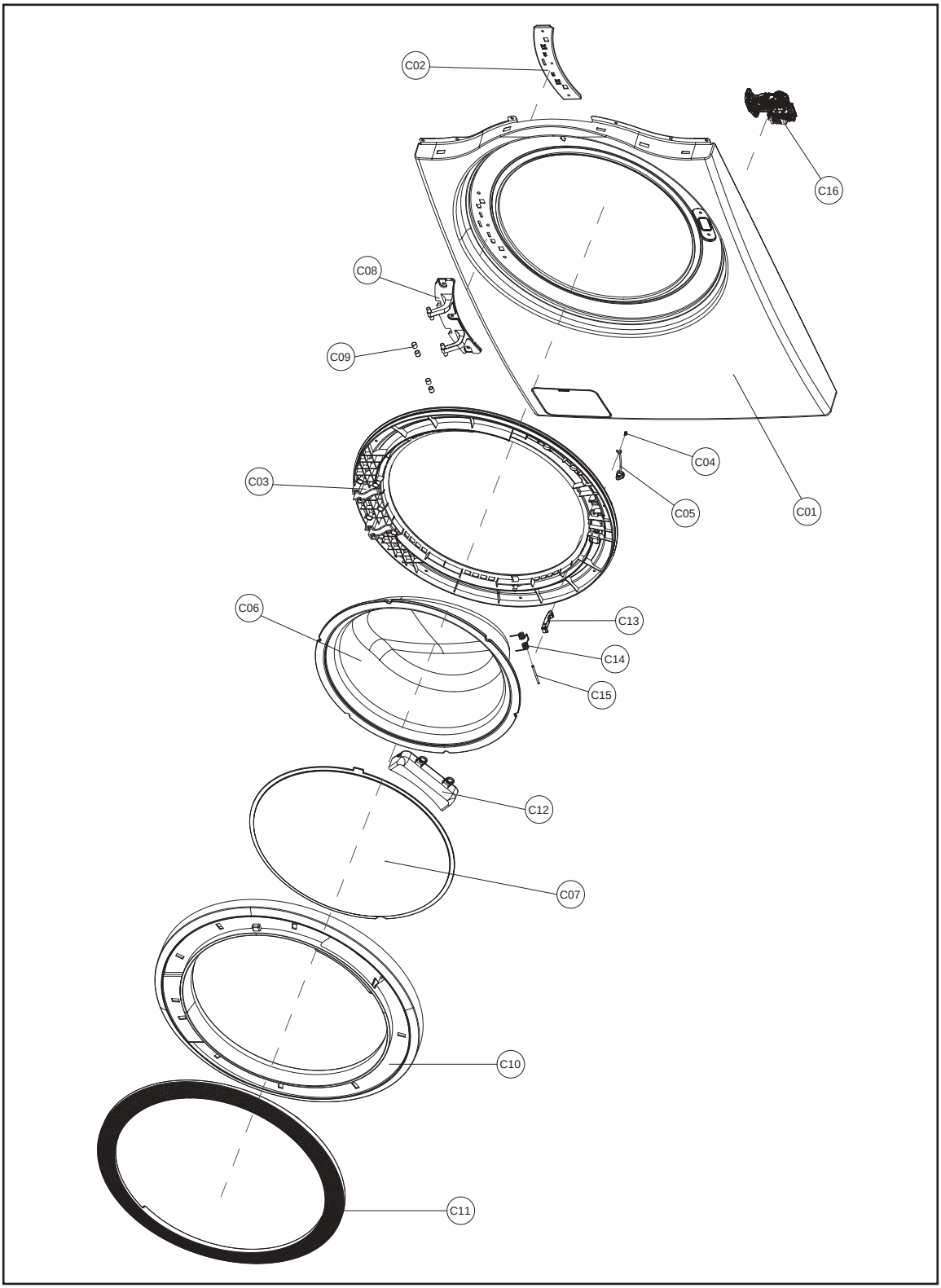
No	Part Name	Part Code	Description	Qt'y	Remarks
P1	WINDOW COURSE R	3615508700	투명 ABS	1	
P2	WINDOW COURSE L	3615508800	투명 ABS	1	
P3	BUTTON POWER	3616643100	ABS	1	
P4	DECORATOR BUTTON POWER	3611693300	ABS, 증착	1	
P5	BUTTON START	3616643000	ABS	1	
P6	DECORATOR BUTTON START	3611693200	ABS, 증착	1	
P7	SPRING BUTTON	3615116400	SUS, ID=15,d=0.7,L=20	2	
P8	PANEL INNER	36142T1J00	ABS	1	
P9	PANEL OUTER	36142T1H00	ABS	1	
P10	BUTTON FUNCTION	3616642800	ABS, 증착	1	
P11	BUTTON SELECT & ADD	3616642700	ABS	1	
P12	WINDOW DISPLAY	3615508600	투명 ABS	1	
P13	BUTTON LIQUID & RES	3616642600	ABS	1	
P14	DECORATOR DISPLAY	3611693000	ABS, 증착	1	
P15	DECORATOR BUTTON DIAL	3611693100	ABS, 증착	1	
P16	BUTTON DIAL	3616642900	ABS	1	
P17	PCB AS	PRPSSW2D62		1	
P18	PROTECTOR PCB	3618345400	SECC 0.6T	1	
P19	SCREW TAPPING		T2 TRS 4x14	10	

2. INLET BOX AS



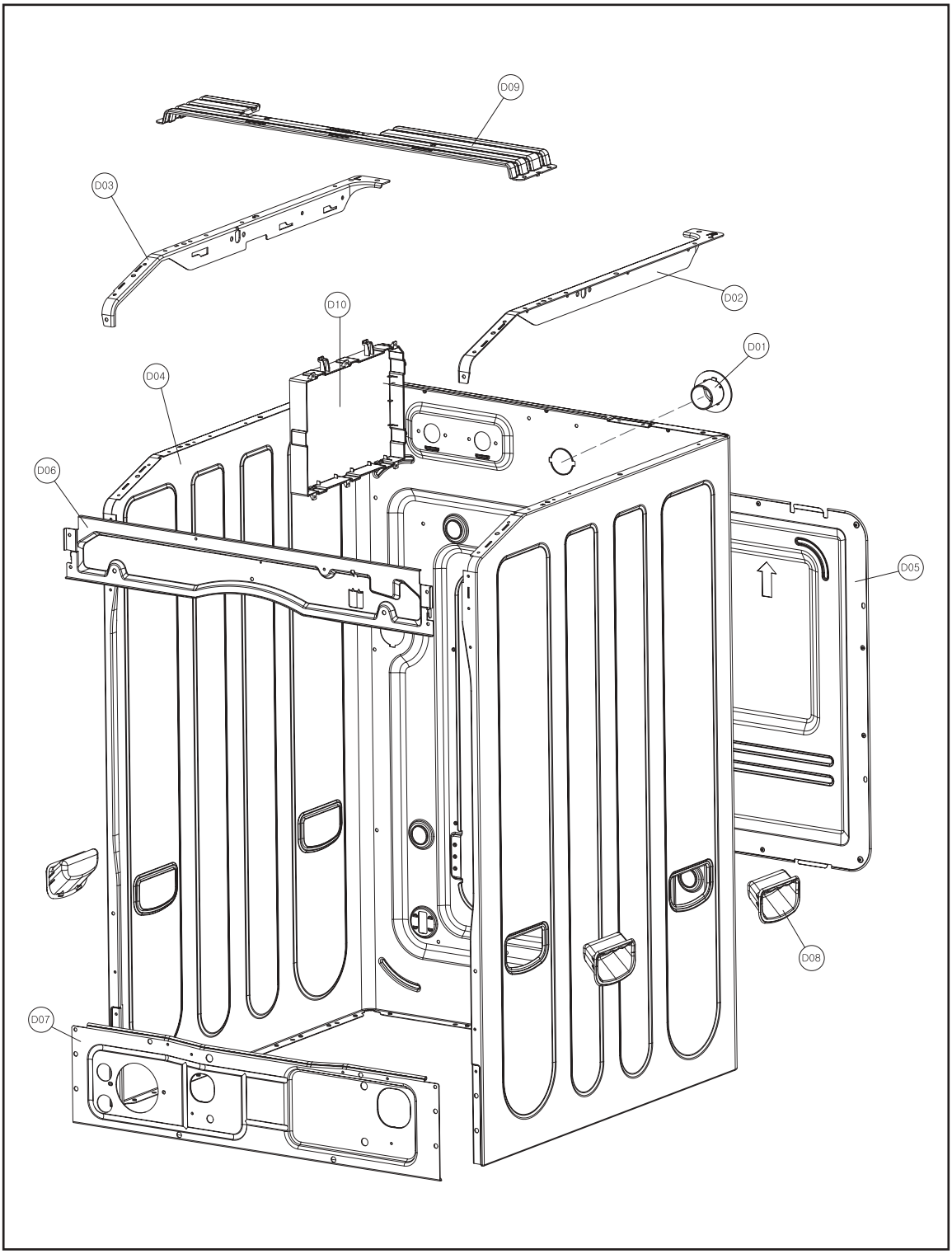
No	Part Code	Part Name	Description	Qt'y	Remarks
B01	3610528200	BOX INLET	PP	1	
B02	3613274100	HOSE INLET	EPDM	1	
B03	3618110600	NOZZLE TOP	PP	1	
B04	3618110700	NOZZLE UNDER	PP	1	
B05	36189L7000	UNIT PUMP AS	DWD-U120R 220-240V 50/60HZ	2	
-	3612799200	HARNESS FEED	DRUMUP-2ND, AUTO-FEED SUB-HARNESS	1	
B06	3615304800	SUPPORTER BOX	SBHG 1.2T	1	
B07	3610610500	BRACKET SENSOR	ABS	4	
B08	3614825900	SENSOR LIQUID A	TAB#250+PIPE(59.5)	1	
B09	3614826400	SENSOR LIQUID B	TAB#250+PIPE(64.5)	1	
B10	3614826500	SENSOR LIQUID C	TAB#250+PIPE(77.8)	1	
B11	3614826600	SENSOR LIQUID D	TAB#250+PIPE(82.8)	1	
B12	3614426000	PIPE JOINT I	PP	1	
B13	3614426100	PIPE JOINT Y	PP	1	
B14	3613273500	HOSE CLEANING TANK L	EPDM	1	
B15	3613273700	HOSE CLEANING TANK R	EPDM	1	
B16	3613273600	HOSE CLEANING TUB	EPDM	1	
B17	3614010300	PACKING CLEANING	EPDM	2	
B18	3611910500	FILTER	SUS. MESH 100	2	
B19	3614825200	SENSOR PRESSURE	5V DRUM, DN-DD01, DL-DW01 INLET 90	1	
B20	3611203200	CLAMP AS	ID=60, WIRE+GUIDE+BOLT+NUT	2	
B21	3613270930	HOSE WATER SUPPLY	EPDM ID8.5 OD12.5_SHOWER	0.23	
B22	3613270930	HOSE WATER SUPPLY	EPDM ID8.5 OD12.5_SHOWER	0.125	
B23	3613270930	HOSE WATER SUPPLY	EPDM ID8.5 OD12.5_SHOWER	0.4	
B24	3613270930	HOSE WATER SUPPLY	EPDM ID8.5 OD12.5_SHOWER	0.165	
B25	3615414800	VALVE INLET	220-240V 1-WAY HOT PP-BRACKET	1	
B26	3615415050	VALVE INLET	220~240V,3WAY,RINSE GUIDE유,PP/BRACKET	1	
B27	3611205800	CLAMP HOSE	100H, ID=13.8 W=10.0 0.9T	12	
B28	3614413300	PIPE JOINT(HOSE INLET)	PP	1	
B29	3613270930	HOSE WATER SUPPLY	EPDM ID8.5 OD12.5_SHOWER	0.67	

3. CABINET F ASSY



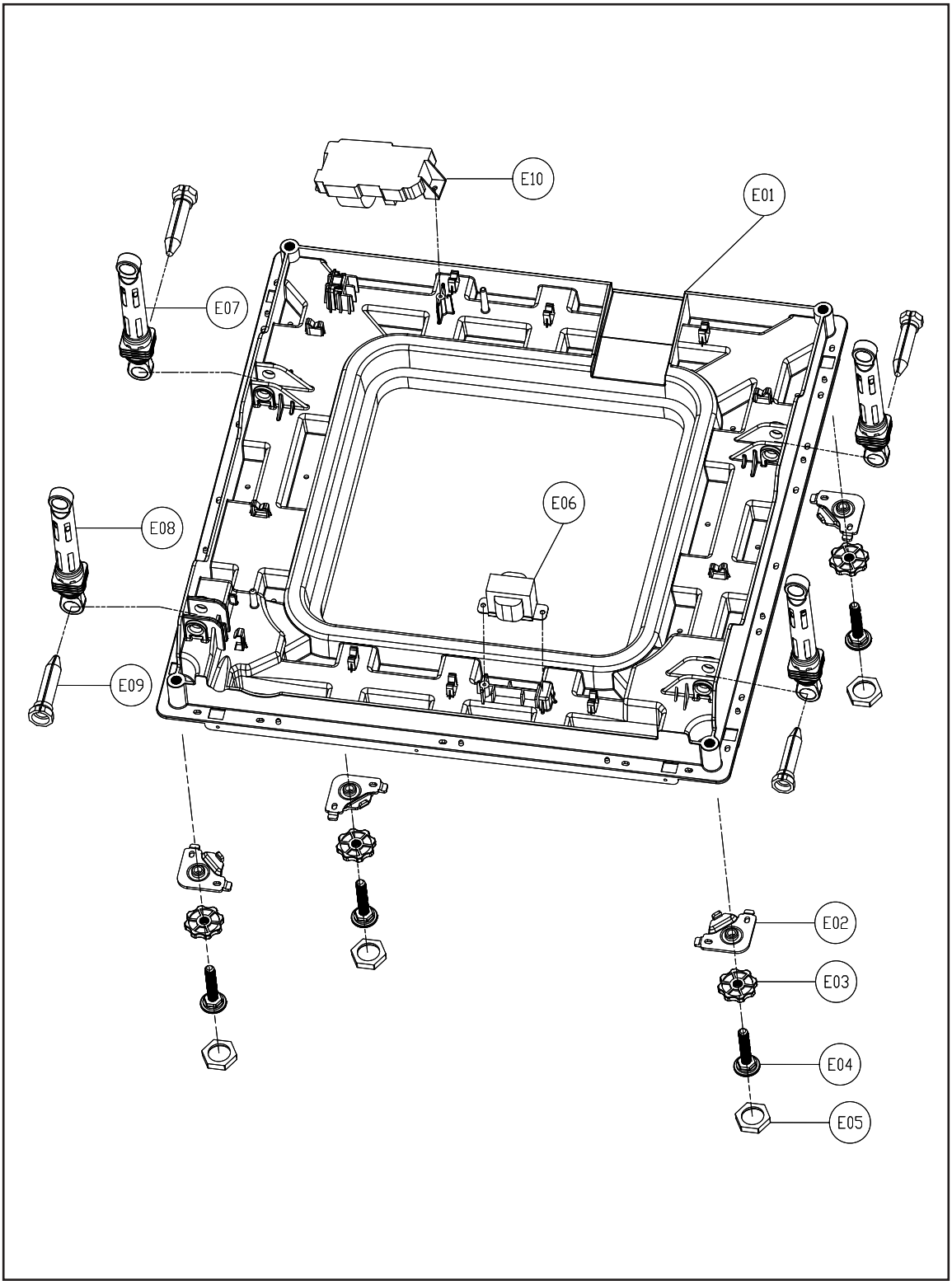
No	Part Code	Part Name	Description	Qt'y	Remarks
C01	3610813000	CABINET F	SECD 0.8T, DWD-T120R	1	
C02	3614539800	PLATE HINGE SUPPORT	SPG 0.8T, DWD-T110R	1	
C03	3612209800	FRAME DOOR I	PP, DWD-T110R	1	
C04	3612904100	HINGE SAFETY LOCK	NYLON66	1	
C05	361A113200	DOOR SAFETY LOCK	NR	1	
C06	361A110600	DOOR GLASS	GLASS (DWD-100DR)	1	
C07	3618304300	PROTECTOR GLASS	ABS UT0510TNP	1	
C08	3612903800	HINGE DOOR	AL, DWD-T110R	1	
C09	3610916500	CAP HINGE DOOR	POM	4	
C10	3612211400	FRAME DOOR O	ABS	1	
C11	3611692500	DECORATOR DOOR O	ABS	1	
C12	3612612200	HANDLE DOOR	ABS	1	
C13	3613100900	HOOK DOOR	ZNDC	1	
C14	3615115400	SPRING HOOK	SUS304,	1	
C15	3613101000	HOOK SHAFT	SUS, D=3.0	1	
C16	3619047200	SWITCH DOOR LOCK	DL-S1.250V16A.BITRON	1	

4. CABINET ASSY



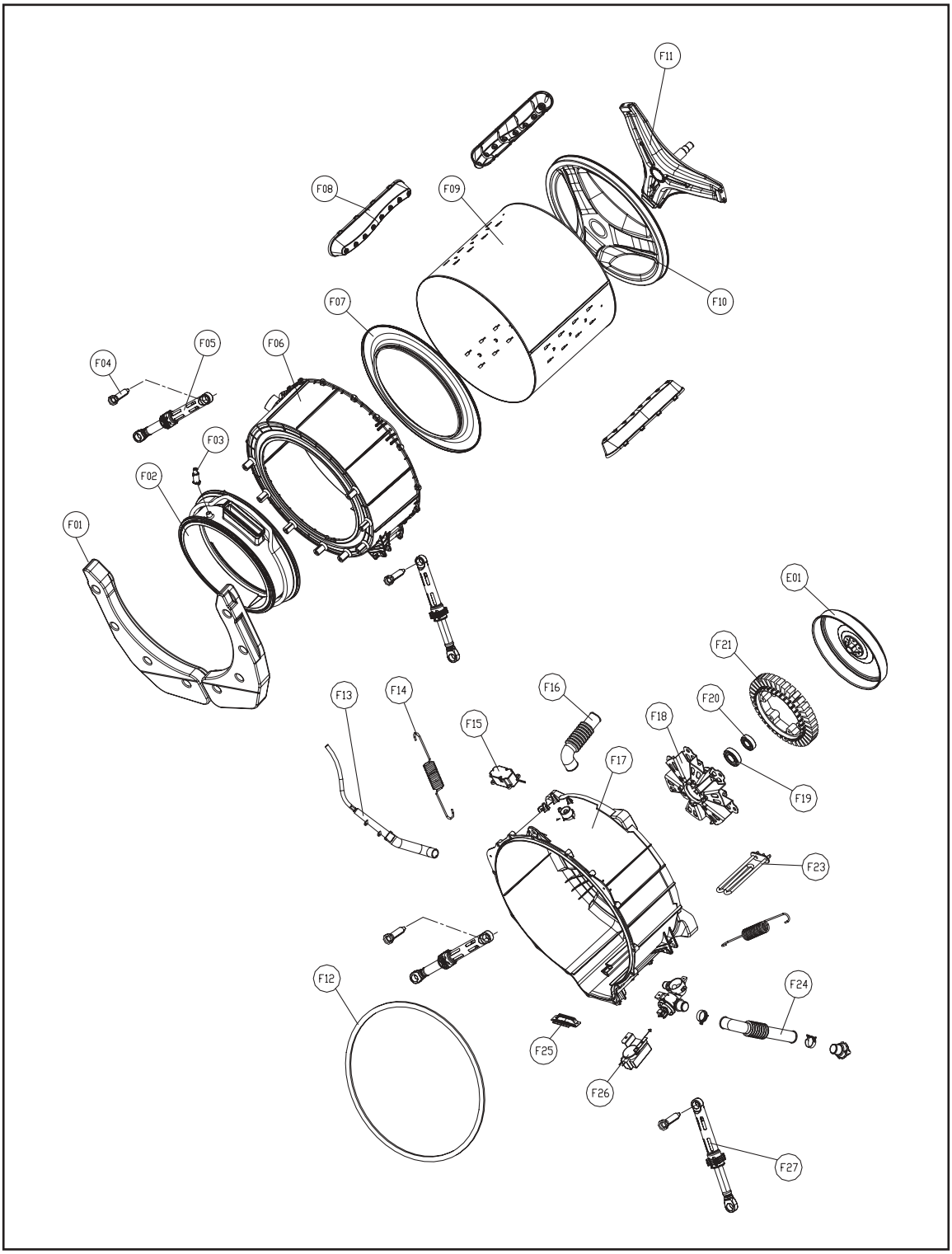
No	Part Code	Part Name	Description	Qt'y	Remarks
D01	3618103110	NOZZLE AIR	PP, DWD-100DR	1	
D02	3612209300	FRAME TOP R	DWD-T110R, GI 1.6T	1	
D03	3612209400	FRAME TOP L	DWD-T110R, GI 1.6T	1	
D04	3610812900	CABINET	SGCC 0.8T, DWD-T120R	1	
D05	3611425540	COVER BACK AS	COVER BACK + PAD CABINET	1	
D06	3612209500	FRAME UPPER	DWD-T110R, SBHG 1.2T	1	
D07	3612204201	FRAME LOWER	SGCC 1.0TX634*186 DWD-110RP	1	
D08	3612608100	HANDLE CABINET	PP, DWD-100DR	2	
D09	3612209600	FRAME COVER	DWD-T110R, SBHG 1.6T	1	
D10	3611146200	CASE PCB MAIN	HIPS, DWD-T110R	1	
	3610PCBC11	PCB AS	C-UD123XNHS	1	
	3610PCBC10	PCB AS	C-UD123XLHS	1	

5. BASE U AS



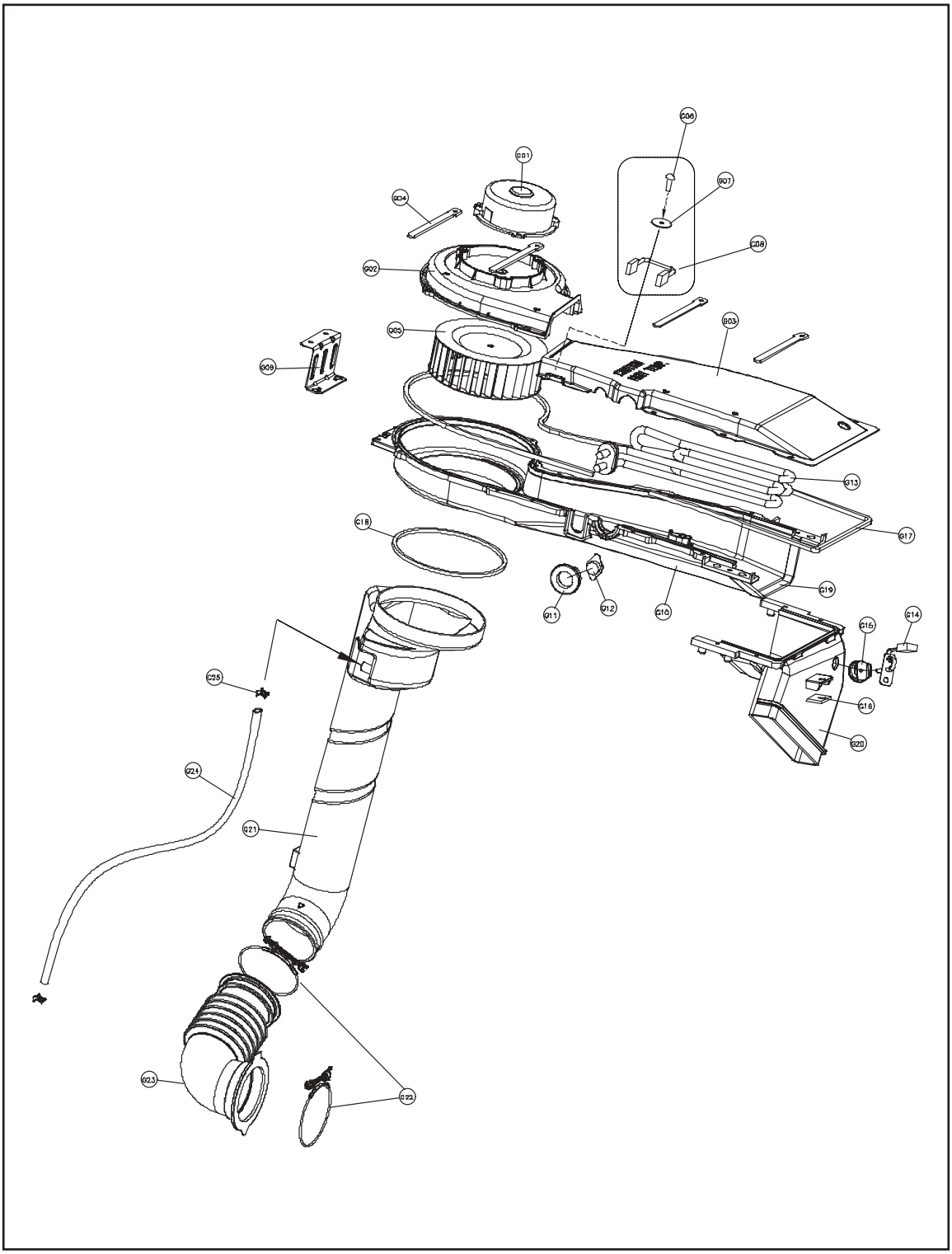
No	Part Name	Part Code	Description	Qt'y	Remarks
E01	BASE U	3610393200	PP, DWD-T120R	1	
E02	SUPPORTER LEG	3615303600	PO+도금, 3.0T	4	
E03	FIXTURE LEG	3612006400	ABS, DWD-100DR	4	
E04	SPECIAL BOLT	3616029000	10 X 1.25, 51MM	4	
E05	FOOT	3612100600	BUTYL, DWD-100DR	4	
E06	REACTOR	52G043J002	DWD-100DR, 4A	1	
E07	DAMPER FRICTION	361A700150	110N AKS ST=170-260 DL=197.5 LOW NOISE	2	다른 끝단은 TUB AS에 체결
E08	DAMPER FRICTION	361A700110	70N AKS ST=170-260 DL=197.5 LOW NOISE	2	다른 끝단은 TUB AS에 체결
E09	DAMPER PIN	361A700200	AKS D=14.5	4	
E10	EMI FILTER(K19B)	3611909300	DWLF-K19(B110),X0.47U.Y1000P.VAR471K.NON FUSE	1	

6. TUB ASSY


F11
F08
F09
F10
F07
F04
F05
F06
F03
F02
F01
E01
F21
F13
F14
F16
F20
F15
F18
F17
F19
F23
F12
F24
F25
F26
F27

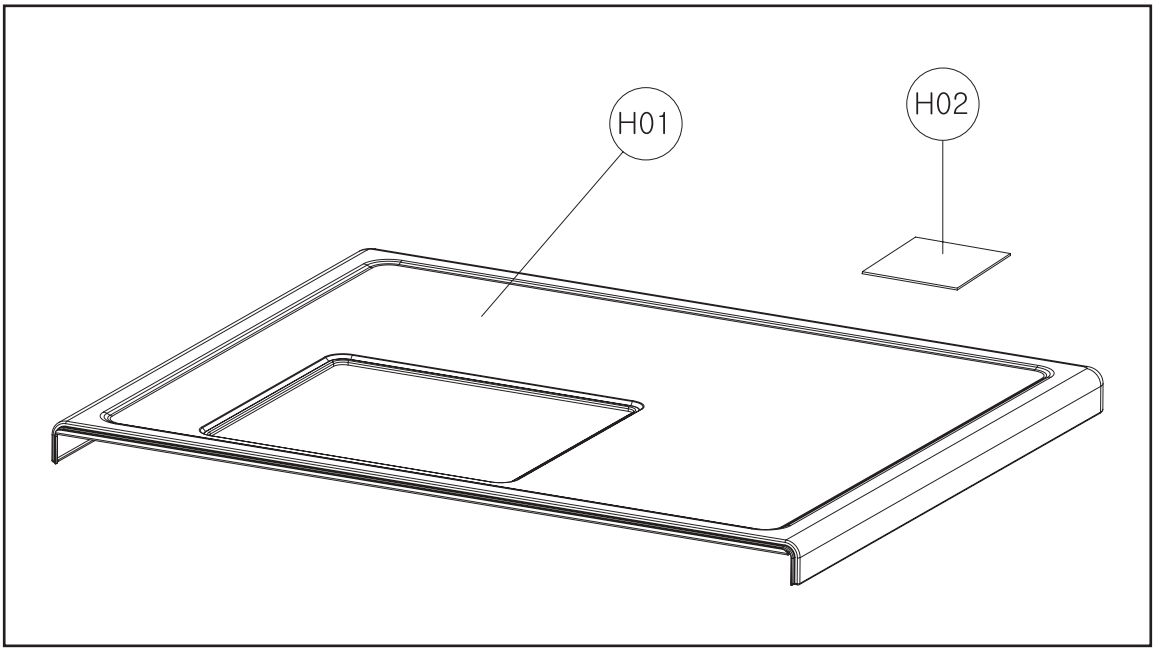
No	Part Name	Part Code	Description	Qt'y	Remarks
F01	BALANCER WEIGHT	3616109000	DWD-T120R	1	
F02	GASKET DRY	3612323900	EPDM	1	
F03	NOZZLE SHOWER	3618104000	PP, DWD-100DR	1	
F04	DAMPER PIN	361A700200	AKS D=14.5	4	
F05	DAMPER FRICTION	361A700110	AKS, 70N	2	
F06	TUB FRONT	3618829800	FRPP, DWD-T120R	1	
F07	DRUM FRONT	3617003101	SUS, 0.5T	1	
F08	LIFTER WASH	361A400600	PP NANO-SILVER	3	
F09	DRUM CENTER	3617003010	SUS, 0.6T	1	
F10	DRUM REAR	3617003210	SUS, 0.6T	1	
F11	SPIDER AS	361A300200	SPIDER(ALDC)+SHAFT(S45C)	1	
F12	GASKET TUB	3612324300	L=1810	1	
F13	AIR TRAP AS	3610AAR120	DWD-T120R	1	
F14	SPRING SUSPENSION	3615115800	DWD-T120R	2	
F15	UNIT BUBBLE PUMP	36189L4150	DWD-T120R	1	
F16	HOSE AIR	3613266300	EPDM	1	
F17	TUB REAR	3618829700	FRPP, DWD-T120R	1	
F18	BEARING HOUSING	3616304600	ALDC	1	
F19	BEARING INNER	3616303100	6206Z	1	
F20	BEARING OUTER	3616303200	6205Z	1	
F21	UNIT STATOR BLDC	36189L4800	36SLOT	1	
F22	UNIT ROTOR BLDC	36189L4900	MAGNET24	1	
F23	HEATER WASH	3612802400	220V, 2KW	1	
		3612802410	230V 2KW	1	
F24	HOSE DRAIN I	3613266100	EPDM	1	
F25	FIXTURE HEATER	3612009300	SUS0.7T	1	
F26	DRAIN MOTOR	36196TAJ00	SV-MXT20D	1	
F27	DAMPER FRICTION	361A700150	AKS	2	
F28	UNIT DRAIN PUMP AS	36189L5K30	220V-240V 50HZ	1	ONLY PUMP MODEL
		36189L5J30	220L 50HZ	1	ONLY PUMP MODEL

7. DUCT B AS + DUCT PIPE AS



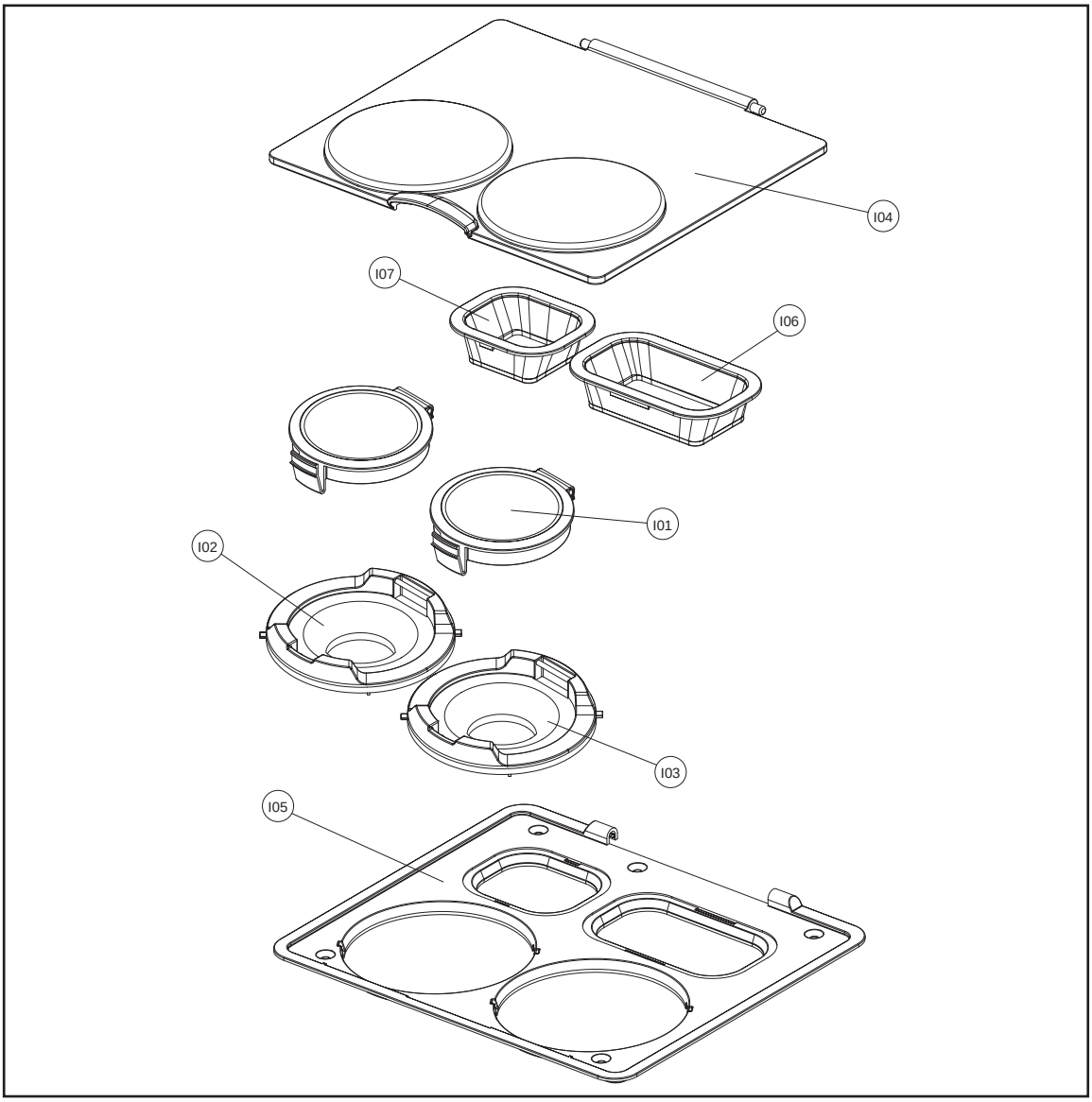
No	Part Name	Part Code	Description	Qt'y	Remarks
G01	UNIT FAN MOTOR	36189L3Z20	ISM-7780 6DWWA 24V.	1	
G02	COVER DUCT	3611428700	ALDC	1	
G03	DUCT B UPPER	361A202100	ALCOST 0.5T	1	
G04	CLAMP CORD	3611203330	DABE-2, A=9, B=5,3, L=105	3	
G05	FAN AS	3611885900	DI33 FAN	1	
G06	SCREW TAPPING	7122400811	T2S TRS 4x8	1	
G07	SPECIAL SCREW AS	3616030100	TAPTITE P, TRS 4*16, WASHER	1	
G08	FUSE TEMPERATURE	361A800120	128˚C(G4A0115C) 15A 250V	1	
G09	FRAME HEATER FRANGE	3612209700	SBHG 1.2t	1	
G10	DUCT B LOWER	361A202200	AL, 3t	1	
G11	PACKING THERMOSTAT	3614009900	SILICON	1	
G12	SWITCH THERMOSTAT	3619046500	ON 120˚C OFF 150˚C 230V	1	
G13	HEATER DRY	3612800900	220V, 2100W	1	
G14	THERMISTOR DRY	361AAAAC30	R40=26.065kΔΩ, R90=4.4278ΔΩ	1	
G15	PACKING RUBBER	3614009800	SILICON	1	
G16	CUSHION DRY	3611570500	NBR, 20 x20 x 3T	2	
G17	GASKET SEAL A	3612324200	EPDM FOAM, DIA=5, L=1335	1	
G18	GASKET SEAL B	3612320810	EPDM FOAM, L=412, 4.9 x 4.4 x 4.8	1	
G19	GASKET INLET	3612323800	EVA, 10 x 211 x 1T	1	
G20	DUCT GUIDE	361A202300	AL, 3T	1	
G21	DUCT AS	361A200850	T120R	1	
G22	CLAMP AS(DUCT)	3611203700	DUCT	2	
G23	BELLOWS DUCT	3616403000	EPDM	1	
G24	H0SE WATER SUPPLY	3613270900	T120R응축수용	1	
G25	CLAMP SPRING	3611203800	ID=15.5, T=0.6, B=10	2	

8. PLATE TOP ASSY



No	Part Code	Part Name	Description	Qt'y	Remarks
H01	3614539910	PLATE T	DWD-U12	1	
H02	3613559300	LABEL TOP UNIFICATION	DWD-T'S PLATE TOP	1	

9. Cover Plate AS



No	Part Code	Part Name	Description	Qt'y	Remarks
I01	3611430000	COVER LIQUID TANK	ABS	2	
I02	3615304900	SUPPORTER LIQUID TANK L	ABS	1	
I03	3615305000	SUPPORTER LIQUID TANK R	ABS	1	
I04	3611430100	COVER DETERGENT	MBS	1	
I05	3611430200	COVER PLATE	ABS	1	
I06	3612511700	GUIDE DETERGENT MAIN	PP	1	
I07	3612511800	GUIDE DETERGENT PRE	PP	1	

5. Control Part Function Specification

1. Function Specification

1) Sequence chart

Division		Time	Normal		Heavy stain	Whites		Memory
			Liquid DET.	Power DET.	Middle	small	Middle	Middle
Pre.Wash	Senising	20sec						
	Water Supply	2min			■			
	Pre. Wash	10min			■			
		8min			■			
	Drain	1min			■			
	Balancing Spin	2min			■			
	Mid. Spin	3min			■			
Washing	Senising	20sec	■	■		■	■	
	Water Supply	2min	■	■	■	■	■	■
	Washing 1 (Heating)	90min				75min	85min	
		80min				■	■	
		35min		32min		■	■	
		30min	27min	■	■	■	■	
		25min	■	■	■	■	■	■
	Washing 2	40min						
		25min	■	■	■	■	■	■
		20min	■	■	■	■	■	■
		15min	■	■	■	■	■	■
Rinse	Drain	1min	■	■	■	■	■	■
	Balancing Spin	2min	■	■	■	■	■	■
	Mid. Spin	3min	■	■	■	■	■	■
	Water Supply	2min	■	■	■	■	■	■
	Washing 1	3min	■	■	■	■	■	■
	Drain	1min	■	■	■	■	■	■
	Balancing Spin	2min	■	■	■	■	■	■
	Mid. Spin	3min	■	■	■	■	■	■
	Water Supply	2min	■	■	■	■	■	■
	WASHING 2	3min	■	■	■	■	■	■
	Drain	1min			■	■	■	■
	Balancing Spin	2min			■	■	■	■
	MID. SPIN	3min			■	■	■	■
	Water Supply	2min			■	■	■	■
	WASHING 3	3min			■	■	■	■
Spin	Drain	1min	■	■	■	■	■	■
	Balancing Spin	2min	■	■	■	■	■	■
	Main Spin	7min						
		5min	■	■	■	■	■	■
		3min	■	■	■	■	■	■
End	Crease care	60sec	■	■	■	■	■	■
	End	10sec	■	■	■	■	■	■
Remain Time Display			1:42	1:47	1:59	2:26	2:36	1:36

NOTE

1. The heavy stains washing course includes pre-washing in the basic cycle.
2. In the standard course, rinsing is done twice.
3. For the standard course at 40 degrees, the heating washing time includes the first seven minutes without heating. The duration of washing 2 is 40 minutes which is 20 minutes longer.
4. Depending on the water temperature, the heating washing time is changed.
5. In the standard course, if full capacity (LS480 or higher) is detected, then additional one hour of cold water washing is added. The result is 2:47. (For the domestic inspection in the future.)
6. For the liquid DET + standard course, the default water temperature is COLD.
7. For the powder DET + standard course, the default water temperature is 40 degrees.
8. For the standard course with COLD water, the total washing time with liquid DET is 1:00 and it is 1:47 with powder DET.
9. The default setting for My Preferred Course is 40 degrees of water temperature, rinsing three times and med spin. After that, you should select your own setting.

Division		Time	Delicate	Sports wear	Blankel	Sports shoes	Tub clean	Air wash
			Small	Small	Middle	Small	Medium	
Washing	Soal	30min					■	
	Water Supply	2min	■	■	■	■	■	
	Washing 1 (Heating)	60min						
		50min						
		35min						
		30min						
		20min				■		
	Washing 2	25min			▮	▮		
		20min	15min	8min	▮	▮	10min	
		15min	■	■	▮	▮	■	
Rinse	Drain	1min	■	■	■	■	■	
	Balancing Spin	2min	■	■	■		■	
	Mid. Spin	3min	■	■	■	■	■	
	Water Supply	2min	■	■	■	■	■	
	Washing 1	3min	■	■	■	■	■	
	Drain	1min	■	헹굼1회	■	■	■	
	Balancing Spin	2min	■	물추가	■		■	
	Mid. Spin	3min	■		■	■	■	
	Water Supply	2min	■		■	■	■	
	Washing 2	3min	■		■	■	■	
	Drain	1min			■			
	Balancing Spin	2min			■			
	Mid. Spin	3min			■			
	Water Supply	2min			■			
	Washing 3	3min			■			
Spin	Drain	1min	■	■	■	■	■	
	Balancing Spin	2min	■	■	■		■	
	Main Spin	7min	▮	▮	▮		▮	
		5min	▮	▮	▮	▮	▮	
		3min	▮	▮	▮	▮	▮	
Dry	Crease care	60sec				■	■	
	Dry	100min						
		30min				■	■	■
	Cooling	5min				■	■	■
	End	10sec				■	■	■
	Wrinkle-free drying	30min					■	■
End	Crease care	60sec		■	■			
	End	10sec	■	■	■	■		
Remain Time Display			49	32	1:11	1:47	1:51	35

NOTE

1. The full drying course includes drying in the basic cycle.
2. The wrinkle-free operation is performed when the laundry is not removed after the cycle is completed. It is not included in the entire cycle.
3. Shoes course does not include wrinkle-free operation.
4. The shoes drying course does not follow the default spin sequence.

Division		Time	Baby Care	Steam soak			
			Middle	Small	Middle		
Dry	Crease care	20sec	■	■	■		
	Steam water supply	1min	■	■	■		
	Steam washing	20min	■	■	■		
		15min	■	■	■		
	Steam washing	25min	■	■	■		
		15min	■	■	■		
		10min	■	■	■		
		7min	■	■	■		
	Finishing water supply	1min	■	■	■		
	Finishing washing	25min	■	■	■		
Washing	Soal	30min					
	Water Supply	2min					
	Washing1 (Heating)	60min					
		50min					
		35min					
		30min					
		15min					
	Washing2	25min	■	■	■		
		20min	■	■	■		
		15min	■	■	■		
Rinse	Drain	1min	■	■	■		
	Balancing Spin	2min	■	■	■		
	Mid. Spin	3min	■	■	■		
	Water Supply	2min	■	■	■		
	Washing 1	3min	■	■	■		
	Drain	1min	■	■	■		
	Balancing Spin	2min	■	■	■		
	Mid. Spin	3min	■	■	■		
	Water Supply	2min	■	■	■		
	Washing 2	3min	■	■			
	Drain	1min	■				
	Balancing Spin	2min	■				
	Mid. Spin	3min	■				
	Water Supply	2min	■				
	Washing 3	3min	■				
	Drain	1min	■				
	Balancing Spin	2min	■				
	Mid. Spin	3min	■				
	Water Supply	2min	■				
	Washing 4	3min	■				
Spin	Drain	1min	■	■	■		
	Balancing Spin	2min	■	■	■		
	Main Spin	7min	■	■	■		
		5min	■	■	■		
		3min	■	■	■		
End	Crease care	60sec	■	■	■		
	End	10sec	■	■	■		
Remain Time Display			2:32	2:10	2:10		
NOTE		1. The baby care and steam soak course performs 25 minutes of steam washing. 2. The baby love course has 4 rinsing times.					

Division		Time	rag	stocking	lingerie	
			Small	Small	Small	
Washing	Soal	30min				
	Water Supply	1min	■	■	■	
	Washing1	5min				
		3min	▮	▮	▮	
		1min				
Rinse	Drain	1min	■	■	■	
	Balancing Spin	1min	■		■	
	Mid. Spin	1min	■			
	Water Supply	1min	■	■	■	
	Washing 1	2min	■	■	■	
	Drain	1min	■		■	
	Balancing Spin	1min	■		■	
	Mid. Spin	1min	■			
	Water Supply	1min	■		■	
	Washing 2	2min	■		■	
Spin	Drain	1min	■	■	■	
	Balancing Spin	1min	■	■	■	
	Main Spin	3min				
		2min			▮	
		1min	■	■		
End	Crease care	60sec				
	End	10sec	■	■	■	
Remain Time Display			19	13	18	

NOTE	
	1. The stocking course skips medium spins. 2. The lingerie course performs a total of 1 minute of balancing spin and medium spin.

2. Skill of each Sequence

2-1. Washing Sequence

1) Washing Sequence part

Part / Course	LOAD SENSING	Water Level	Time	
			HEATING	Washing
Main	O	Decision Level	Decision Level	Decision Level
Pre	O	Decision Level	X	8 or 10 min
Soak	O	High	X	30 min.

① Prewash and Soak working previous main washing.
② Decision Level' decide Water Level and Time to Load Sensing in Normal, White, Eco-white course.
③ Soak consist of water supply and washing, after this, start main washing.
④ Heater does not working in prewash and soak course.

2) Wahing Time

Water / Part		Water Level	Heating Time	Washing Time	Total Washing Time
Water	cold(Liquid DET.)	Small/Middle	-	25min	45min
	cold(Powder DET.)	Small/Middle	-	72min	72min
	30°C	Small	20min	25min	45min
		Middle	25min	25min	50min
	40°C	Small	20min (+7)	40min	67min
		Middle	25min (+7)	40min	72min
	60°C	Small	30min	25min	55min
		Middle	45min	25min	70min
Whites		Small	75min	25min	100min
		Middle	85min	25min	110min
Steam soak	30,40°C	Small	25min	25min	50min
		Middle	25min	25min	50min
	60°C	Small	30min	25min	55min
		Middle	30min	25min	55min
	90°C	Small	50min	25min	75min
		Middle	50min	25min	75min
Heavy stain	30,40°C	Middle	30min	25min	55min
	60°C	Middle	50min	25min	75min
Delicate		Small	X	15min	15min
Sports wear		Small	X	8min	8min
Blanket		Middle	X	25min	25min
Sports shoes		Small	20min	20min	40min
rag		Small	X	3min	3min
stocking		Small	X	3min	3min
lingerie		Small	X	3min	3min
Baby care	30,40°C	Middle	25min	25min	50min
	60°C	Middle	30min	25min	55min
	90°C	Middle	50min	25min	75min
Air wash		X	X	X	X
Tub Clean		중	X	10min	10min

① Washing Heater isn't reworking after reach decision temperature.
② The washing time is divided into the heating time and the main washing time that follows it. The heating time is gone immediately after the heating is finished or stopped until the heating is completed.
③ The heating time for the standard course with water temperature of 40 degrees includes seven minutes without any heating in the early stage. During this period, the textile is soaked in water fully before heating can be done, so that the temperature drop in the washing tank caused by water supply after heating starts can be prevented.
④ The main washing time of 40 minutes is only for the standard course with water temperature of 40 degrees.
⑤ If the LS is greater than 480 for the standard course, one hour of extra washing time is added. The result is 2:47.
- Achieving target cleanness (for post management)

3) Electric Current Time of Washing Motor

Part / Course	수위	MOTOR TIME On/Off (sec)					Speed
		Water Supply	Washing		Soal	Crease care	
			Heating	main Washing			
Normal	0~40℃	5/15	10/10	18/6	15/180	10/5	45 r.p.m
	60℃	5/15	10/10	10/10	15/180	10/5	45 r.p.m
Whites	95℃	5/15	10/15	7/15	15/180	10/5	45 r.p.m
Steam soak	30~40℃	5/5	10/10	10/10	15/180	10/5	45 r.p.m
	60℃	5/5	10/10	10/10	15/180	10/5	45 r.p.m
	95℃	5/5	10/15	7/15	15/180	10/5	45 r.p.m
Heavy stain	0~40℃	5/15	18/7	10/5	15/180	10/5	45 r.p.m
	60℃	5/15	18/7	10/7	15/180	10/5	45 r.p.m
Delicate	cold	X	X	2/15	X	X	45 r.p.m
Blanket	cold	5/15	X	10/7	X	10/5	45 r.p.m
Sports shoes	0~40℃	5/15	10/10	10/7	15/180	10/5	45 r.p.m
rag	cold	5/15	X	18/6	15/180	X	35 r.p.m
stocking	cold	X	X	1/5	X	X	35 r.p.m
lingerie	cold	X	X	1/5	X	X	35 r.p.m
Baby care	30~40℃	5/5	10/10	10/10	15/180	10/5	45 r.p.m
	60℃	5/5	10/10	10/10	15/180	10/5	45 r.p.m
	95℃	5/5	10/15	7/15	15/180	10/5	45 r.p.m
Tub clean	cold	5/15	X	10/30	15/180	10/5	45 r.p.m

① It works decision cycle.
② If Motor Restriction occur by overload, Motor try to rework opposite direction.
③ While Water Supply, Motor Stick proceed ON first.
④ Crease Care is process of removal laundry that stick to drum It works after Spin Sequence.
⑤ The heating washing motor conduction on/off time for the steam boiling and baby care course refers to finishing washing.
⑥ The motor conduction on/off time for steam heating/washing in the steam boiling and baby love course are 10/5 and 18/6.
⑦ The motor speed for the stocking and lingerie course is 35 rpm.

4) Water supply

① Depending on the course setting or load sensing, the water supply level is selected to be either low or extra low.
② For powder DET injections, the main washing valve is opened and closed five times.
③ If liquid DET is selected, the liquid DET stirring motor operates 30 seconds for low levels and 20 for extra low levels.
④ When liquid DET is fully injected, the washing water supply including constant temperature control begins.
⑤ If powder DET is selected or liquid DET injection completion is memorized, the liquid DET injection process can be skipped.
⑥ When the water supply is completed, the door glass is washed and to clean the tub, the main washing valve and the reserved washing valve operate for ten seconds.

5) Water re-supply
① Water is resupplied when the water level is found to be low by monitoring it every 2 minutes after completing the water supply.
② The motor is stopped during the water re-supply.
③ During washing, a max fifteen times of water re-supply can be done If the water level drops after that, no extra water is supplied.
④ If the water level is lower than the reset level during water re-supply, the IE error is issued and the heater is turned off.

2-2 Rinse operation

1) Water supply

Part / Water Level	Level height (mm)	Frequency (KHz)	Remark
Medium	240	22.96	Additional rising water supply level
Middle	255	22.61	Water level during rinsing
Middle	225	23.18	Rinsing water level

① If clean rinsing is selected, the water is filled up to mid-level.
② In the rinsing cycle, only cold water is supplied.
③ In the final rinsing cycle, the cold water v/v and the reserved washing v/v are opened to inject softener.
④ In the final rinsing cycle, the softener stirring motor operates for 30 seconds for extra low levels and for 40 seconds for low levels.
⑤ The hand cloth and lingerie course's water level is medium (22.61KHz).

2) Re-Water Supply
① After 1 min. in Rinse Sequence, check water level and work Re-Water Supply.

3) Sinse Sequence

part / Level / height(mm)	Water Temp.	Rinse Time	Mid. Spin	Mid. Spin r.p.m	MOTOR On/OFF (sec)		
					rpm.	Water supply	rinse
Normal	Cold	3min	3min	Medium	45 r.p.m	5/15	10/5
Whites	Cold	3min	3min	Small	45 r.p.m	5/15	10/5
Steam soak	Cold	3min	3min	Medium	45 r.p.m	5/15	10/5
Heavy stain	Cold	3min	3min	Medium	45 r.p.m	5/15	10/5
Baby care	Cold	3min	3min	Small	45 r.p.m	5/15	10/5
Sports shoes	Cold	3min	3min	Small	45 r.p.m	X	10/5
Delicate	Cold	3min	3min	Small	45 r.p.m	X	2/20
rag	Cold	2min	1min	Medium	45 r.p.m	5/15	10/5
stocking	Cold	2min	X	X	35 r.p.m	X	1/5
lingerie	Cold	2min	1min	Small	35 r.p.m	X	1/5
Blanket	Cold	3min	3min	Small	45 r.p.m	5/15	10/5
Tub clean	Cold	3min	3min	Small	45 r.p.m	5/15	10/5

① The motor speed for the stocking course and the lingerie course are 35 rpm.

4) Drain

① Befor Drainge Sequence, Water Temp is dropped by cold water supply.
② After Drainage Sequence, Drain Motor is still ON.

5) Medium spins

① In the medium spin cycle, the designated rpm is achieved for each course After performing pre-B and B spins twenty times, if it fails to enter into drying R, then it skips to the next operation.
② When washing is terminated, load sensing is done to detect the amount of water before performing the first medium spins By changing the reference value for unbalance depending on the amount of water, the main spin operation can be performed
③ The medium spin for the sports shoes does not perform balanced spins For three minutes, instead of the main spins, the motor operates at 45 rpm (10 sec on, 10 sec off)
④ The stocking course omits the medium spins cycle.

2-3 Spin Sequence

1) Water discharge
   ① It is done according to functional organization 3-5, water discharge sequence.

2) Balanced spin
   ① Depending on the amount of water, 3 steps of unbalance checks are done. If the criteria is satisfied, then it advances to the next stage, spin R.
   ② Spin B refers to the unbalance detection area at 350 rpm. If the amount of unbalance exceeds the reference value, then it turns back to the textile attachment region.
   ③ Press the pause button in the middle of spin B. It restarts at the textile unfolding region.
   ④ The stocking and the lingerie course omits the unbalance region of 350 rpm.
   ⑤ The hand cloth/stocking/lingerie course reduces the duration of spin B by one minute. In other courses, reduction is two minutes.

3) R (Real) spins
   ① After passing spin B, spin R continues until the entire spin operation is completed.
   ② Depending on the selected spin operation, the target rpm can be varied.
   ③ During the standard and heavy spin operation, the unbalance value is measured to determine the final target rpm.
   ④ If drying is selected and medium spin is selected, then the strongest spin sequence is performed.
   ⑤ If acceleration during spins is stopped, the cycle continues at constant rpm and performs braking.
   ⑥ If you press the pause button during spins, braking will stop the motor.

4) Spins for the sports shoes
   ① No spin B is performed.
   ② Like the washing motor operation, it repeats on/off operation with an interval of 10 seconds for five minutes at 45 rpm.
   ③ To remove water, textile pulling is skipped and low temperature drying is done for 36 minutes.
   ④ When the cycle is completed, to clean the tub, one cycle of rinsing and medium spin is used.

5) Hand cloth spins
   ① Spin B's duration is one minute.
   ② The main spin time is 1 minute. The speed changes quickly from 350 rpm to 710rpm.
   ③ Textile pulling is skipped. When the cycle is completed, to clean the tub, one cycle of rinsing and medium spin is used.

6) Stocking course spins
   ① Spin B's duration is one minute.
   ② Spin B reaches 160 rpm. (350rpm and ascending region omitted.)
   ③ The main spin's duration is 1 minute and the motor turns at 160 rpm.
   ④ To reduce damage to the stocking, textile pulling is omitted.

7) Lingerie spins
   ① Spin B's duration is one minute.
   ② Spin B reaches 160 rpm. (350rpm and ascending region omitted.)
   ③ The main spin's duration is two minutes and the motor turns at 200 rpm.
   ④ To reduce damage to the lingerie, textile pulling is omitted.

2-4 Termination

1) Textile pulling

① After the spin is completed, the laundry is taken off from the drum wall to prevent wrinkles. It lasts for 30 seconds.
② The motor operation depends on the type of textile pulling.
③ No textile pulling is done for soft textile, sports shoes, hand cloths, stockings and lingerie.

2) Termination

① The buzzer sound will be heard for 10 seconds after completing textile pulling. Also the power is off.
② If a drying cycle is added, then it will proceed to drying.
③ When termination begins, the door lock is released.

2-5 Drying cycle

1) Organization of a drying cycle

Ex) If standard drying is selected (total time of 2:30)

Water discharge (one minute) → Drying (144 minutes) → Cooling (5 minutes) → Termination (10 seconds)

→ Wrinkle-free operation (30 minutes) no time displayed

2) Drying spins

If a drying cycle is added to general operation, to improve the dryness, operation takes place at constant rpm higher than the selected spin rpm for a certain duration.

Course	Drying spins	Remarks
Standard	Strongest	Strongest spin selected regardless of the selected spin operation.
High temp boiling	Strongest	
Steam boiling	Strongest	
Heavy stains	Strongest	
High speed	Strongest	

① The drying spin sequence is the same as the general strongest drying sequence.

3) Textile pulling

① At the time of textile pulling, the fan motor starts operating.
② Textile pulling is done for sixty seconds.

4) Motor conduction time for a drying cycle

	Textile pulling	Drying	Cooling	Wrinkle free	Cycle time (min)	Heater off/on
Low temperature	10/5	15/5	10/10	10/50	110	70/60
Low temperature (sports shoes)	10/5	2/30	2/30	X	36	70/60
Ironing	10/5	15/5	10/10	10/50	60	105/95
Standard	10/5	15/5	10/10	10/50	150	105/95
Strong	10/5	15/5	10/10	10/50	200	105/95

① You can select one of 1 hr/ 90 minutes/2 hours.
② If a sports shoes course is selected and the time is selected, the motor conduction time is determined by a sports shoes course.
③ Except for a sports shoes course, if the time is selected then the motor conduction time is determined by the standard course.

5) Drying valve operation
① 20 seconds after drying starts, it continues until drying is completed) 30 sec on/5 sec off.

6) Cooling operation
① Its purpose is to lower the temperature of the tank after drying is completed) The fan motor and the main motor operate at the same time.
② If the drum internal temperature is below 50 degrees, cooling is terminated.
③ The total duration of cooling is five minutes) If the internal temperature can't be lowered, then the time is not reduced anymore.

7) Drying heater operation
① The drying heater continues to operate until drying is completed) 105 deg off/95 deg on.
② 70 deg off/60 deg on for low temperature drying) 50 deg off/40 deg on for a sports shoes course.
③ For air washing, 80 deg off/70 deg on.

8) Wrinkle-free operation
① It lasts for 30 minutes after drying is completed.
② During wrinkle-free operation, the motor only operates) The fan motor and the drying v/v do not operate.
③ If you press the pause button during wrinkle-free operation, the motor is stopped and the door is opened.

2-6 Steam operation

1) Steam water supply
① In steam operation, the water is supplied twice for one minute each.
② Constant temperature control is done until reaching the initial phase steam water supply point.
③ If the laundry is soaked in the water and the water level drops, then water is supplied again) To reduce the number of water supplies, the water supply level is set to 10mm higher than the steam point (1.5 phase).
④ Depending on load sensing or the course setting value, the water supply level is chosen to be low or extra low.
⑤ If powder DET is injected, then the main washing valve is opened and closed five times.
⑥ If liquid DET is selected the liquid DET stirring motor operates for 30 sec for low levels and for 20 sec for extra low levels) At this time, the main washing valve operates too.
⑦ When liquid DET is fully injected, then washing water supply including constant temperature control begins.
⑧ If powder DET is selected or liquid DET injection completion is memorized, then liquid DET injection process is skipped.
⑨ If the water supply is completed, to clean the DET box, the main washing valve and the reserved washing valve operate for 10 seconds.

2) Steam heating

① The heater operates until the target water temperature is reached.

② Steam heating temperature setting

Course	Temperature setting	Time setting
Power saving	70°C	15 min
Standard	75°C	15 min
Strong	90°C	20 min

③ When the target temperature is reached, the time set for steam heating is reduced.

3) Steam washing

① The water temperature is maintained and the steam effect is maximized in this operation.

② Steam washing time

Course	Temperature setting	Time setting
Power saving	7 min	70°C/75°C
Standard	10 min	75°C/80°C
Strong	15 min	90°C/95°C
Strong	25 min	90°C/95°C

③ The reserved washing v/v operates for three seconds every three minute to flow the water to the door glass.

4) Finishing steam water supply

① Steam washing is completed and it is advanced to the main washing) For this purpose, the same water level as the general standard is achieved.

② The time set for water supply is one minute.

5) Finishing steam washing

① It is required when you failed to reach the target temperature in the main washing.

② The time set for water supply is 25 minutes.

6) Main washing

① Same as the general standard washing.

3. Main Function of PCB Program

3-1. LOAD SENSING

1) Deciding the water level

① Normal, White, Eco-White Course will be followed by this process.

② Check the water level with dry laundry at the starting wash.

③ Check the water level by using motor output data during 20 sec, 65rpm.

2) Deciding Spin Starting Step.

① Check after finishing washing step with wet laundry.

② Checking by using motor output data during 20 sec, 65 rpm.

③ The Decided data is different depending on loading condition.

3-2. Balance Spin

1) Motor running during balance spin

① Spreading the laundry : Rotating the same 45 rpm with left and right direction alternatively.

② Unbalance checking point : first step, sheck the U.B at 95 rpm, 160 rpm second step, check the U.B at 95 rpm 350 rpm.
Third step at 300 rpm. If the unbalance data is over the criterion
This process will be repeated.

③ After drain, check the unbalance data again. This is so-called balance spin step.

3) Property of balance spin

① Conducting 20 times maximum.

② If the washer can not pass balance spin step during 20 times, then water will be supplied.

③ If the washer can not pass 20 times of balance spin, UE error mode will be displayed on '18:88'

3-3. DOOR S/W

1) The working principle of Door S/W

① Door Locking

Bimetal on (3 sec) --> solenoid (supply 20msec pulse 2 times)

② Door Unlocking

Bimetal off --> solenoid(supply 20msec pulse, until lock)

③ After door locking all parts can work nomally.

④ After pressing power button, if the temperature of wash thermistor is over 55℃ or the water level is over the safety level, the door will be locked.

⑤ The door will be unlocked immediately after all processes are finished.

⑥ The door can be opened during processing if there is no problem to unlock.

2) DOOR OPEN SYSTEM

① If add the laundry during washing, press the door unlock button.

② Door open sequence at abnormal condition.

3-4. Child Lock

① Press the "Spin" and "Condensing Dry" button simultaneously during processing.

② Under the Child Lock function, only power button is working.

③ During Child Lock function, CHL will be displayed on '18:88'

④ In order to unlock Child Lock mode, press "Spin" and "Condensing Dry" simultaneously.

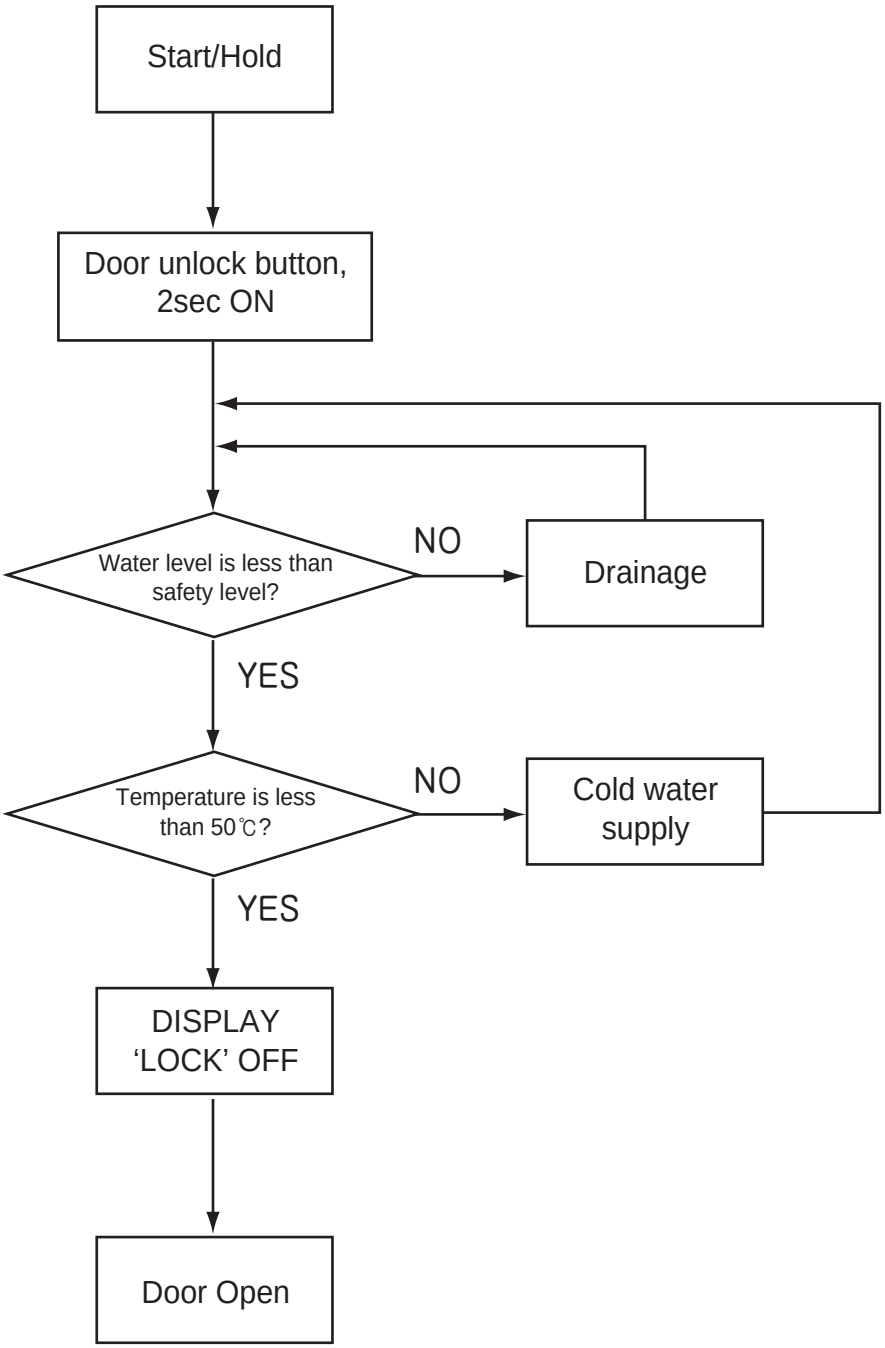
3-5. The sequence of drain

① If the checking time to reset point is below 1 min, the remaining drain time is 30 sec.

② If the checking time to reset point is over 1 min, the remaining drain time is 2 min.

③ If the checking time to reset point is over 10 min, OE signal will be appeared on PCB.

④ If the temperature is over 50℃ , the water will be supplied to high water level, then the drain will start.


Start/Hold
Door unlock button, 2sec ON
Water level is less than safety level?
NO
Drainage
YES
Temperature is less than 50℃?
NO
Cold water supply
YES
DISPLAY 'LOCK' OFF
Door Open

5. TEST MODE

5-1. Testing Mode

PCB and other electronic parts will be tested without water supply whether they are normal or not.

1) Process

press power button --> press "SPIN" button 3 times with pressing "WASH" button --> 'L d' will be shown on LED -->
Whenever pressing "TEMP" button 1 time, below process will be occurred.
MICOM Ver. --> L C (Lock Closed) --> run (count) ---> b1, b2, b3, b4, b5, b6, b7
-> F (Fan Motor) -> H (Hot V/V)
-> C (Cold V/V) -> P (prewashing V/V) -> d (dry V/V) -> bb (bubble)
-> dr (drain motor) -> L O(Lock S/W Open)

2) More details

1 When turn on 'LOCK' signal, all process is conducting normaly.
2 When working starts, the PCB displays all the sensor conditions.
3 In this case, BLDC Motor is not tested. In order to test it, select spin or rinse.

5-2. Continous testing mode

1) Process

after pressing "WASH", "RINSE", "SPIN" button simultaniously, press "POWER" button.
ALL LED On --> SPIN button ---> ALL LED off
--> L C (Lock Close) ---> r (Motor right) --> L (Motor Left)
--> F (Fan Motor) ---> H (Hot V/V) --> C (Cold V/V) --> b (Pre whsh V/V) --> d (dry V/V)
--> bb (bubble) --> h1 (Wash heater)--> h2(Dry heater) --> dr (Drain motor On)
-->L O(Lock S/W Open)

2) More tails

1 LED test can be done with all LED On.
2 All sensor conditions will be shown on PCB during processing.

6-1. Error Display

6-1. IE (Input Error) - Error in water supply

1) Conditions of Occurrence
   ① In case the designated water level is not reached in 5 minutes during water supply or re-supply

2) All LEDs are turned off and 'IE' blinks in18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

6-2. OE (Output Error) - Error in drainage

1) Conditions of Occurrence
   ① In case water level does not reach reset point in 10 minutes after drainage starts

2) All LEDs are turned off and 'OE' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

6-3. UE (Unbalance Error)

1) Conditions of Occurrence
   ① In case main spin-drying is not reached within 20 cycles of balance spin-drying
   ② In case balance spin-drying fails during interim spin-drying, UE occurs as the cycle moves to the next process.

2) All LEDs are turned off and 'UE' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error mode is cleared by opening door and organizing the laundry in spin-dry chamber, closing door and pressing start/ temporary stop button. Then, spin-drying begins again.

6-4. LE (Lock Error) - Door opening error

1) Conditions of Occurrence
   ① When intending to begin cycle by pressing start/ temporary stop button while door is opened

2) All LEDs are turned off and 'LE' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

6-5. E1 - Water level detection error

1) Conditions of Occurrence
   ① In case water level is below reset or overflow is detected in line test mode

2) Water supply motor is kept on until water level falls below reset.

3) All LEDs are turned off and 'E1' blinks in 18:88 display.

4) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

5) Error display is cleared when turning off/ on power.

6-6. E2 - Overflow error

1) Conditions of Occurrence
   ① In case water level in water tank is above overflow level due to continuous operation of water supply valve

2) Water supply motor is kept on until water level falls below reset.

3) All LEDs are turned off and 'E2' blinks in 18:88 display.

4) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

5) Error display is cleared when turning off/ on power.

6-7. E4 - Water leakage during washing

1) Conditions of Occurrence
   ① In case water level falls below re-supply even after 15 times of re-supply prior to finishing of water heating

2) All LEDs are turned off and 'E4' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

6-8. E9 - Abnormalities in water level sensor

1) Conditions of Occurrence
   ① In case water level frequency is of 15KHz or lower and 30KHz or higher during cycle due to abnormalities in water level sensor, etc.

2) All LEDs are turned off and 'E9' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

6-9. Motor-related Error

1) E5 (DC-Link High Voltage) Error
   ① In case DC-link voltage to IPM increases to 450V or higher
   ② Motor operation is stopped and 'E5' is shown in display window.
   ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
   ④ Error display is cleared when turning off/ on power.

2) E6 (EMG) Error
   ① In case current detected with EMG port is of 20A or higher
   ② Motor operation is stopped and 'E6' is shown in display window.
   ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
   ④ Error display is cleared when turning off/ on power.

3) E7 (Direction) Error
   ① In case signal of Hall IC is different from the predicted signal according to direction of rotation
   ② Motor operation is stopped and 'E7' is shown in display window.
   ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
   ④ Error display is cleared when turning off/ on power.

4) E8 (Initial Operation Fail) Error
   ① In case input signal of Hall IC is abnormal due to problems in motor connection, etc.
   ② Motor operation is stopped and 'E8' is shown in display window.
   ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
   ④ Error display is cleared when turning off/ on power.

6-10. Error in Temperature Sensor

1) H2 Error - Washing temperature sensor open/ short
   ① In case washing temperature sensor is defective or not connected
   ② Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
   ③ Error display is cleared when turning off/ on power.

2) H4 Error - Washing temperature sensor overheating
   ① In case temperature detected by washing temperature sensor is 95℃ or higher
   ② Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
   ③ Error display is cleared when turning off/ on power.

3) H5 Error - Water temperature error in wool/ delicate course

① In case water temperature in wool/ delicate course is 45℃ or higher

② Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

③ Error display is cleared when turning off/ on power.

4) H6 Error - Abnormality in washing heater

① Within 15 minutes after heater operation begins;
In case standard temperature is of 42℃ or lower: If temperature does not increase by 2℃ or more In case standard temperature is higher than 42℃: If temperature does not increase by1℃ or more

② If temperature falls below standard temperature by 2℃ or more due to re-supply of water, etc., standard temperature is reset as the current temperature and error check time of15 minutes is reset.

③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

④ Error display is cleared when turning off/ on power.

5) H8 Error - Washing heater overheating

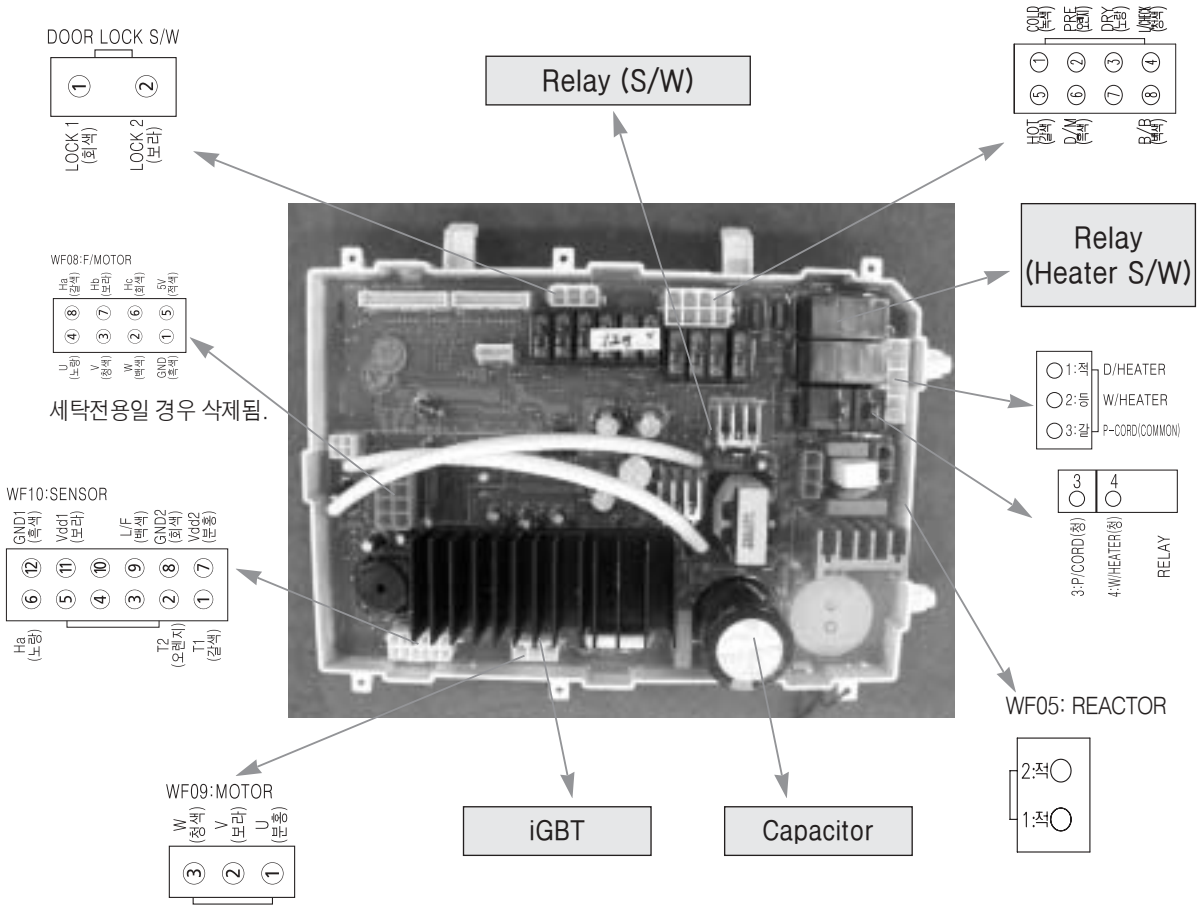
① In case washing heater temperature increases by 5℃ or more within 30 seconds when there is no water in tank, etc.

② Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

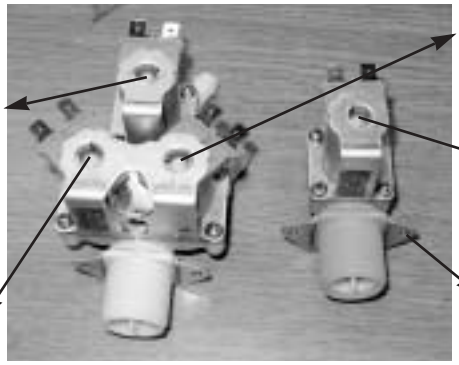
③ Error display is cleared when turning off/ on power.

7. ELECTRONIC FIELD PARTS LIST AND SPECIFICATION

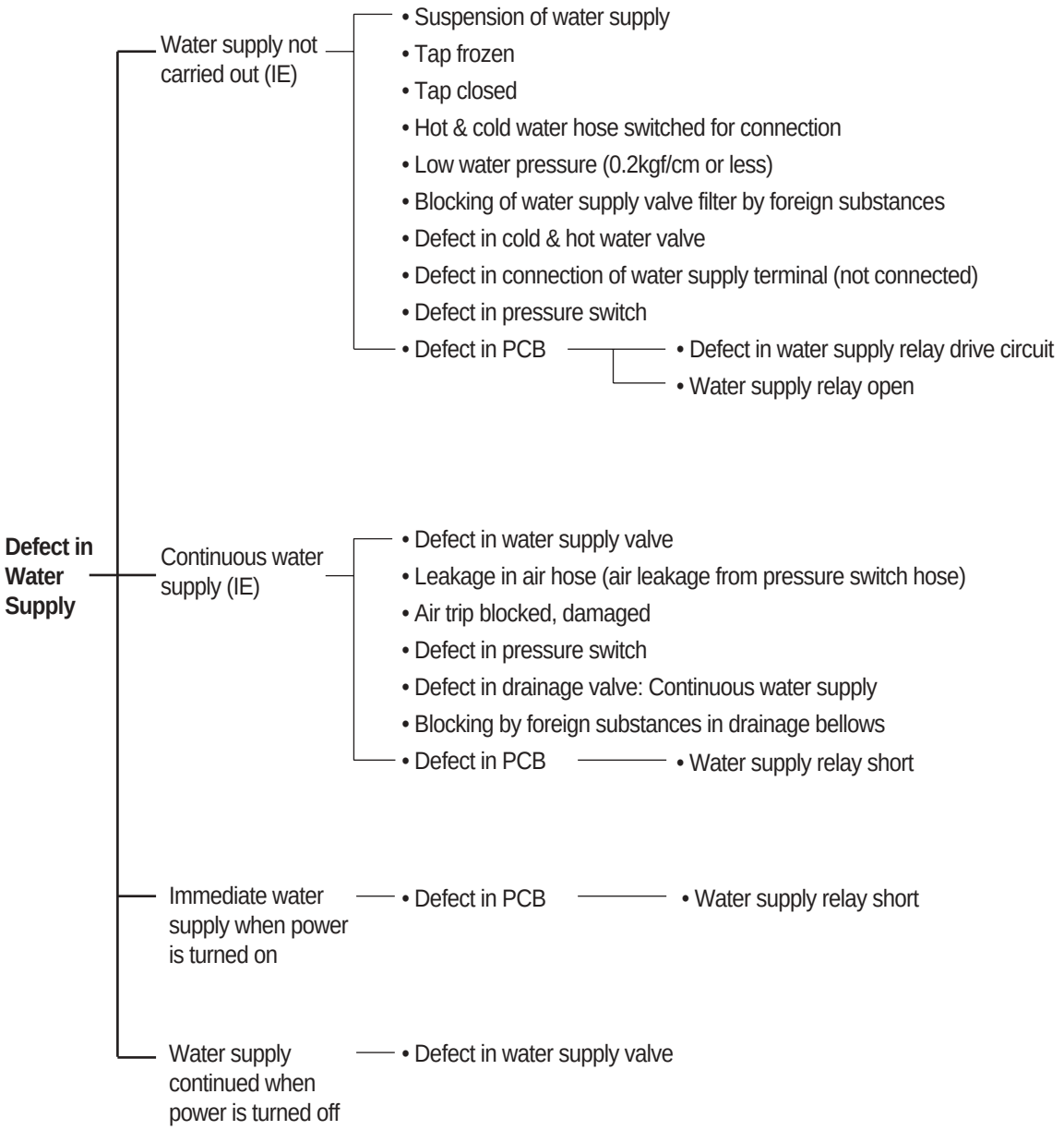
1. PCB PIN



2. VALVE INLET

Classification	3-hole Valve and Hot Water Valve
Code	3-hole: 3615415070, 3615415050, Hot Water: 3615415700, 3615414800
Color	Gray
Coil Resistance	4320 ~ 5280 Ω
Use	Supplying water for washing/ pre-washing and bleach
Appearance Structure	 Washing Water Input Valve; Rre-washing Water Input Valve; Hot Water Input Valve; M4×4 : CABINET 4; Bleach Input Valve

Symptoms of Breakdown	Detailed Symptoms	Cause	Diagnosis of Defect	Solution	PCB Error Mode
Water not supplied	Water supply not carried, only noise is heard	Water tap not opened	Check for tap opening.	Open water tap.	"IE"
		Coil short	Check if resistance between water supply valve terminals is within 4320~5280Ω.		"IE"
		Excessive foreign substances in SUS filter	Remove water supply hose and check for foreign substances in filter.	Clean out foreign substances from inside the filter.	"IE"
		Foreign substances in valve	-	Replace water supply valve.	"IE"
	Water supply not carried out without noise	Connector loosened	Visually check connector connection status.	Administer re-insertion.	"IE"
		Coil short	Check if resistance between water supply valve terminals is within 4320~5280Ω.	Replace water supply valve.	"IE"
		Wiring short	Wiring short -> Conduction test		"IE"
Water is continuously supplied (inside tub)	Continuous water supply in power 'on' state	Defect in water level sensor	Refer to water level sensor defect check method.	Replace water level sensor.	"E2"
		Defect in pressure hose	Check for blocking of holes in pressure hose.	Replace defect parts.	"E2"
	Continuous water supply in power 'off' state	Defect in water supply valve	-	Replace water supply valve.	-
Others	Water leakage through sides	Defect in water supply valve assembly, etc.	Floater restraint, loosening -> S/W not working Check for leakage through the sides of water supply valve.	Replace water supply valve.	-


Defect in Water Supply
Water supply not carried out (IE)
• Suspension of water supply
• Tap frozen
• Tap closed
• Hot & cold water hose switched for connection
• Low water pressure (0.2kgf/cm or less)
• Blocking of water supply valve filter by foreign substances
• Defect in cold & hot water valve
• Defect in connection of water supply terminal (not connected)
• Defect in pressure switch
• Defect in PCB
• Defect in water supply relay drive circuit
• Water supply relay open
Continuous water supply (IE)
• Defect in water supply valve
• Leakage in air hose (air leakage from pressure switch hose)
• Air trip blocked, damaged
• Defect in pressure switch
• Defect in drainage valve: Continuous water supply
• Blocking by foreign substances in drainage bellows
• Defect in PCB
• Water supply relay short
Immediate water supply when power is turned on
• Defect in PCB
• Water supply relay short
Water supply continued when power is turned off
• Defect in water supply valve

Symptoms of Breakdown	Inspection Spot	Inspection Method	Inspection Result	Problem Identified	Repair Method
Water supply not carried out		1) Suspension of water supply 2) Water tap locked 3) Cold-hot water hose incorrectly connected 4) If no defect is found, dismantle water supply hose and check water supply valve filter.	- Cold/ hot water hose switched -Large amount of rust, sand and dust, etc.	-Defect in cold/ hot water hose assembly -Defect in cleaning of water supply filter (blocked)	-Assemble cold/ hot water hose correctly. -Clean water supply filter.
	Water supply valve	1) Measure coil resistance in water supply valve. 2) Remove top cover and visually check for separation of water supply valve terminal connector and wiring short/ connection status. 3) In case water valve operation sound is heard, but water supply is not carried out, check for blocking of water supply valve or restraint on plunger.	-5.3kW or higher -Connector loosened/ not inserted -Electric wire short -Sound and defect in water supply due to foreign substances in bellows	-Coil short -Connection defect -Electric wire short -Structural defect in water supply valve	-Replace water supply valve. -Try reconnection or remove elements of connection defect. -Try reconnection or remove elements of connection defect. -Replace water supply valve.
	Pressure Switch	1) Check for 'E9' in display window.	-E9	-Loosening of pressure S/W terminal or electric wire short -Defect in pressure S/W	-Connect terminal of pressure S/W. -Connect terminal of PCB. -Replace pressure S/W.
Water supply not carried out	PCB	1. Check PCB pin connector insertion status. 2. Power is supplied to water supply valve terminal, but water supply is not administered.	Electric wire easily loosened when tugged PCB water supply circuit open, damaged (water supply relay operation not carried out)	Pin connector housing not inserted Defect in water supply circuit	Completely insert connector housing. Replace PCB.
Continuous water supply	PCB	1. Immediate supply when power is turned on	PCB water supply circuit or relay short (continuous conduction to valve)	Water supply relay short	Replace PCB.
	Water supply valve	1. Check if water supply is continuously carried out even if power is not on.	Water supply bellows blocked/ deformed	Defect in water supply valve	Replace water supply valve.
	Drainage drive motor (valve housing)	1. Check for normal operation of water supply valve/ water supply status. 2. Check if water is drained through drainage hose. 3. Check for foreign substances inside valve housing. 4. Check for foreign substances in drive motor wire. 5. Forcefully restore SUS wire.	-Not closed due to foreign substances inside drainage housing -Wire caught by foreign substances outside drive motor -Forced restoration not possible	-Foreign substances in valve housing -Foreign substances -Defect in drive motor restoration	-Remove foreign substances. -Remove foreign substance. -Replace drive motor.

3. Water Level Sensor

1) Spec. of Water Level Sensor

	HEATER SAFETY	STEAM	RESET	LOW	MID	RINSE	ADD WATER	OVERFLOW
(kHz)	24.55	24.736	25.2	23.2	23.75	23.18	22.96	22.6

O/F: Forced drainage is necessary as water level is high. When this level is reached, water supply must be stopped and drainage must be forcefully administered.

RESET :

1. Spin-drying begins 30sec after drainage level reset is reached.
2. Heater operation level

Low: Small load of laundry, therefore considered to be water level of 'low'

Medium: Large load of laundry

Medium High: Water level for rinsing

Safety: Door open possible
Door opened only when water level is below safety level

2) Breakdown Analysis

Symptoms	Detailed Symptoms	Cause	Diagnosis	Solution	PCB Error Mode
Continuous water supply	Water valve normal	Defect in pressure sensor hose	Check for holes.	Replace hose.	"E2"
		Blocking of pressure sensor hose	Visual checking	Remove foreign substances.	"E2"
"E9"	Occurrence in water level sensor 30kHz or higher	Connector loosened	Visually check connector connection status.	Administer re-insertion.	"E9"
		Wiring short	Wiring short -> conduction test		"E9"

4. POWER CORD

1) Specificafion

Classification	Rated	Cord Thickness	Color	Code	Type	Length	Remarks
DEC	250V/15A	1.5sq	Gray	3611339340	LP-31 SJT	2.3m	-
DEC	125V/13A	1.5sq	Gray	3611340410	UL.SJT	2.3m	-
DEC	250V/16A	1.5sq	Gray	3611339930	EU-2P	2.3m	-
DEC	125V/15A	2.0sq	Gray	3611339810	BSMI	2.3m	-

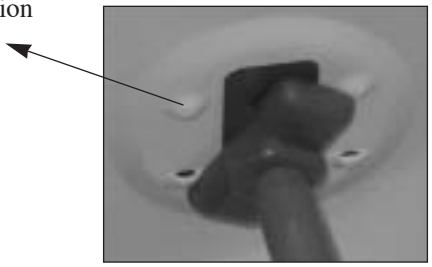
2) Assembly

4 embossed parts in cabinet

-> To prevent loosening after assembly

-> SS: 2 special screws

-> LG: Forced indentation



[Before]

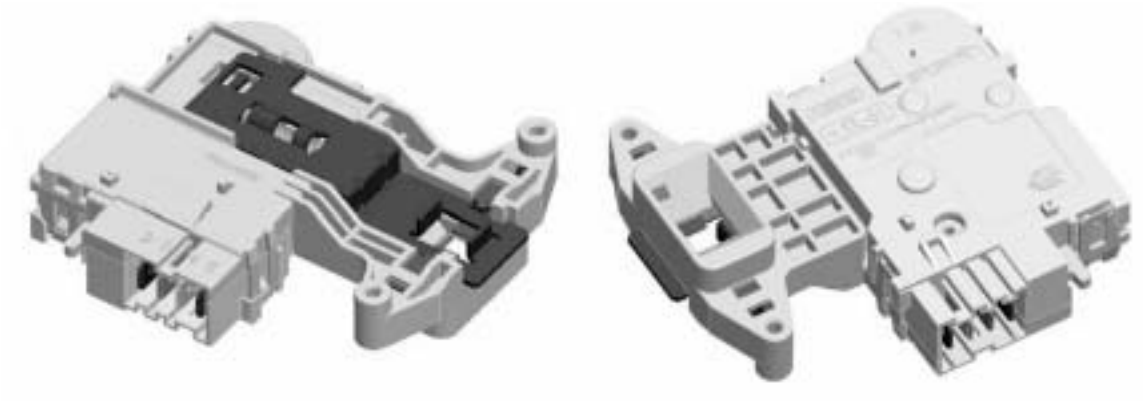
[After]

. CONNECTOR

-> #1806 Housing 3P Used: Using both ends only and not the hole in the middle (materials highly resistant to flame)

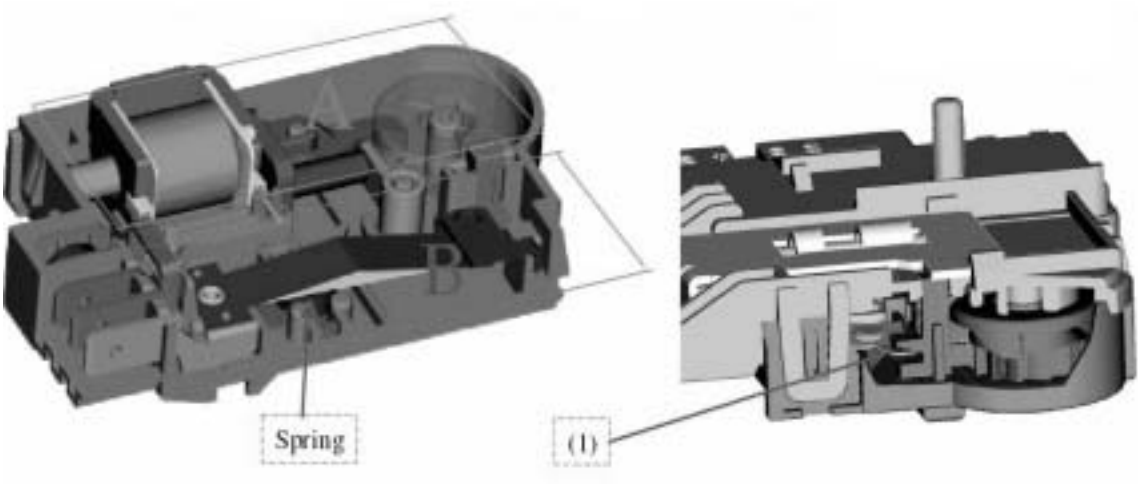
-> To prevent fire caused by high current

5. DOOR LOCK SWITCH



PART CODE	DESCRIPTION
3619047200	DOOR LOCK DL-S1 250V PTC-SOLENOID TYPE
3619041210	DOOR LOCK DL-S1 125V L6A BITRON

1) DOOR LOCK S/W

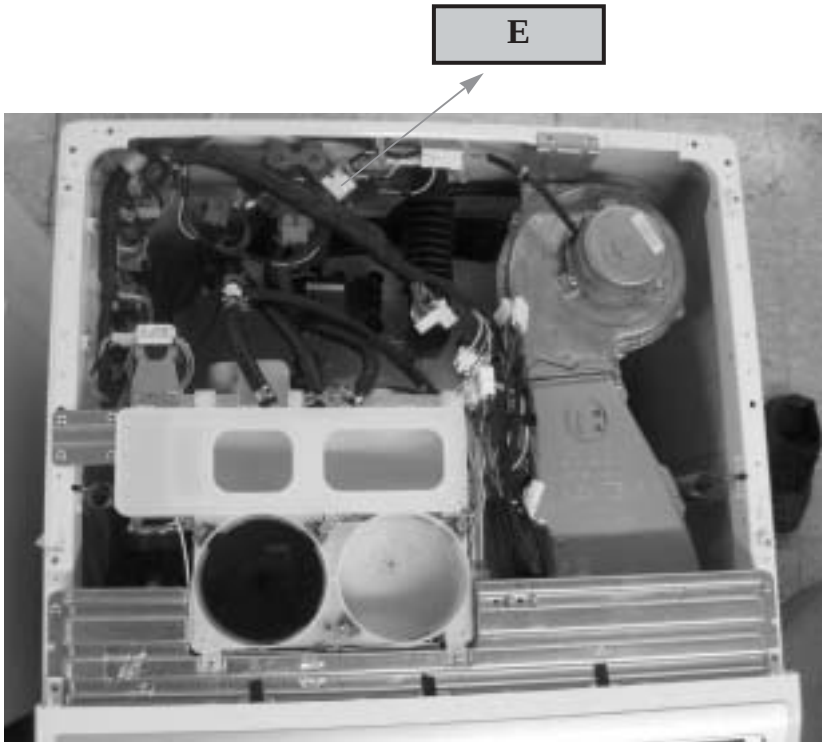


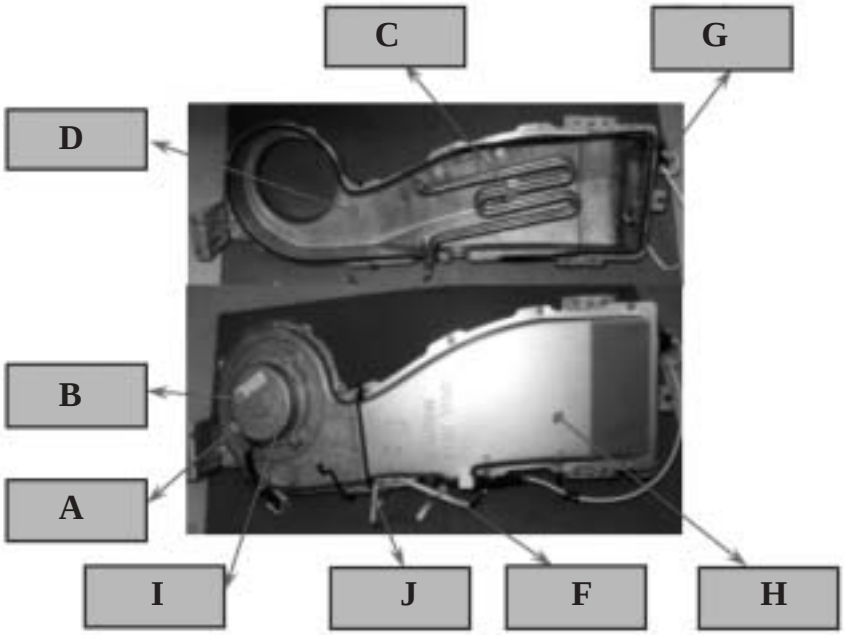
4) Diagnosis of Defect

Symptoms	Detailed Symptoms	Cause	Diagnosis of Defect	Solution	Error Mode
Ticking noise	Tick' during initial operation and 'tick-tick' during temoprary suspension: 'DF' type only	Normal noise	Normal sound generated during solenoid operation when 'sliding CAM' is locked/ unlocked to close or open door.		–
LE'	Continuous occurrence of 'tick' noise and 'LE': 'DF' type only	Connector loosened	Visually checking connector connection status	Insert connector.	"LE"
		Terminal loosened from connector	Referring to door lock S/W dismantling and checking methods below	Insert connector. S/W 4 or 5 terminal	"LE"
		Door not completed closed	-	Completely close door.	"LE"
		Abnormality in hook of door	-	Replace door AS.	"LE"
		Defect in catch CAM operation	Occurrence of continuous 'tick' noise unlike normal sound	Replace door S/W.	"LE"
	1. 'LE' occurrence without 'tick' noise in 'DF' type	Connector loosened	Visually checking connector connection status	Insert connector.	"LE"
		Terminal loosened from connector	Referring to door lock S/W dismantling and checking methods below	Insert terminal. S/W 2 or 3 terminal	"LE"
		Breaking of solenoid coil	Referring to picture below	Replace door S/W.	"LE"
Door does not open.	Power failure, forced power off during operation	PCB MICOM' cannot open door in case of power failure or forced power S/W off during operation. Door can be opened in the max. of 5min.			
	No power failure and power on	Water in drum	Checking if water level is higher than safety level	Door opens after drainage.	–
		Inside the drum hot	Prevention of door opening to prevent burn caused by hot laundry after drying		
	Others	Door does not open normally in case of loosening of connector/ terminal and breaking of solenoid coil during operation. Administer measures after test according to the following method.			

1. Heater

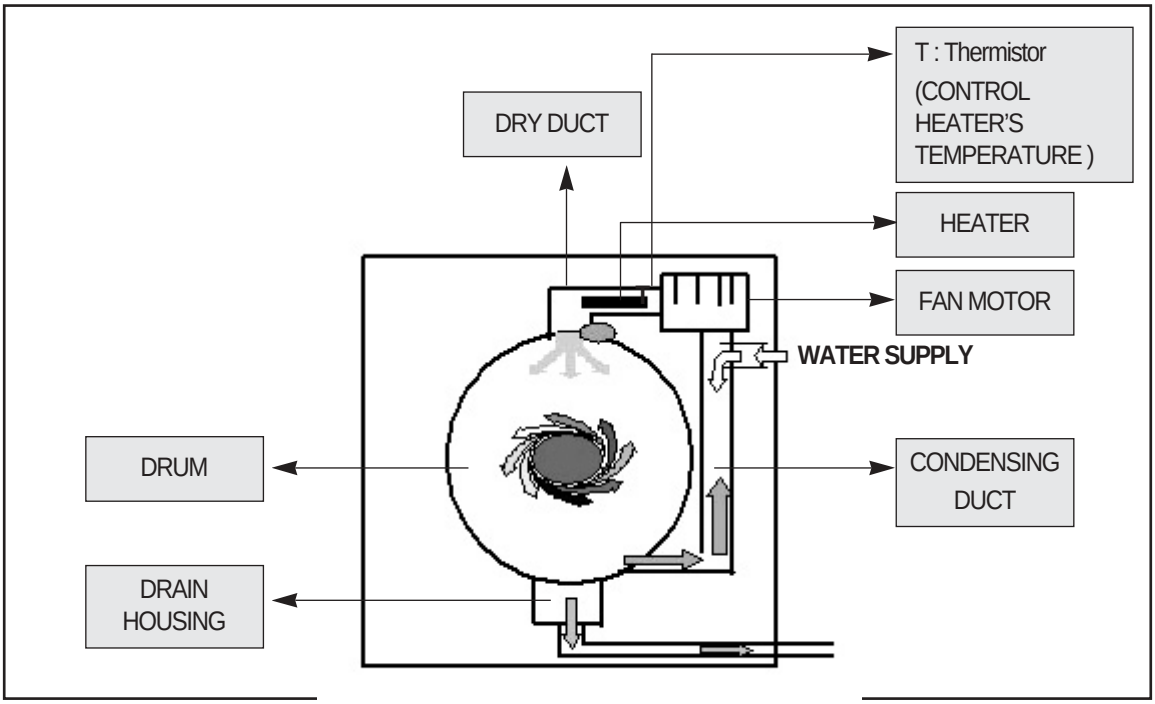
1) Spec of Heater of Washing Machine





on	Parts name
	DUCT COVER
	FAN MOTOR
	HEATER DRY
	DUCT B LOWER
	VALVE INLET(DRY)
	THERMOSTAT
	THERMISTOR
	DUCT B UPPER
	FAN AS
	FUSE TEMPERATURE

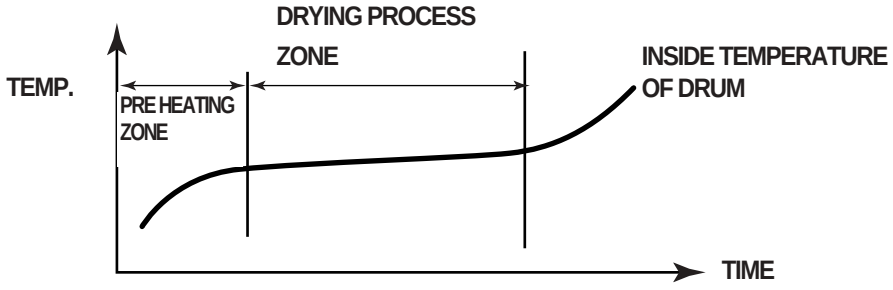
2) Dry Function Diagram



While rotating DRUM, DRY HEATER applice heat to air and FAN blows it into DRUM evaporating water in the laundry.

- Evaporated water is sucked into CONDENSING DUCT, and condensed in DUCT contacting WATER SUPPLY (condensed water is extracted through DRAIN HOUSING).
- Dry function is performed by continuous repetition of evaporating and condensing circulation as above.

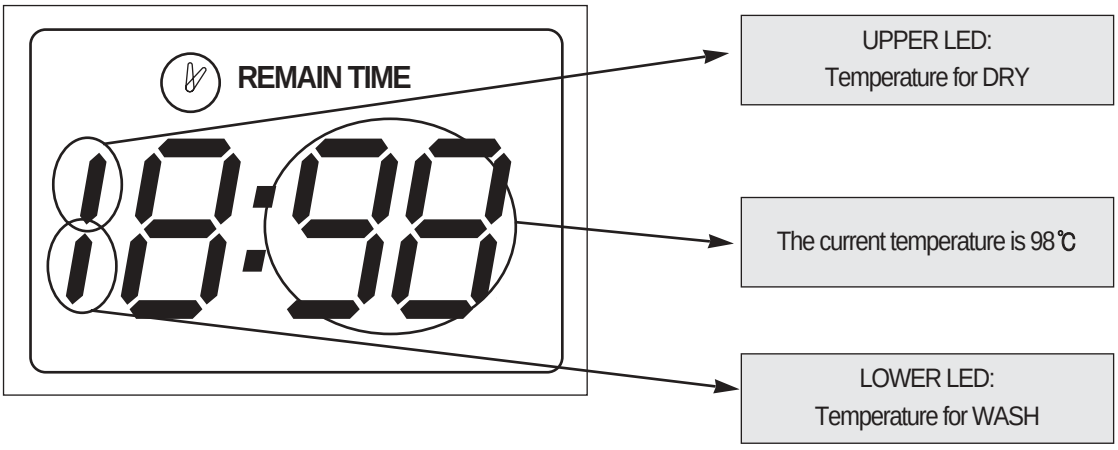
3) Temp- Time Graph During Dry Cycle



4) Dry Course

COURSE	DRY COURSE
LOW TEMP.	Heater control temperature is 60°C On/70°C Off Drying Time is 110min according to Load Sensing Data
IRON	Heater control temperature is 95°C On/105°C Off, with good condition for ironing Drying Time is 60min according to Load Sensing Data
Cupboard	Heater control temperature is 95°C On/105°C Off, drying time is 150 min
STRONG	Heater control temperature is 95°C On/105°C Off, drying time is 200 min
SELECTING TIME	Heater control temperature is 95°C On/105°C Off, customer can select the drying time out of 1:00, 1:30, 2:00

In order to check the drying temperature during process going on : --> press the "DRY" button, the display shows as below.



5) TROUBLE SHOOTING OF DRY SYSTEM

✦ HEATER DRY

Function : heating the air during dry

• FAILURE MODE : * "H7" - The air cannot be heated to 10°C during 2 min.

• CHECKING METHOD : * Check the resistance of heater coil and replace with new one.

✦ Thermistor

Function : sensing the air temperature.

• FAILURE MODE : * The air cannot be heated even though water is supplied.

* "H1" - shot or cut-off

* "H3" - air temp. is reached over 150°C

• CHECKING METHOD : * Check the resistance of thermistor, replace with new one.

✦ FUSE TEMPERATURE

function : protecting from the fire hazard or overheating, if the temp., rises over 128°C, power supply will be cut-off.

• Pictures

• FAILURE MODE : Dry is not performed.

• CHECKING METHOD : Check if fuse is short, and replace with new one.

✥ SWITCH THERMOSTAT(BIMETAL)

function : control the duct temperature, if the temp reached over 150°C, all power supply will be cut. and if the temp go down 120°C the power will be ON.
protecting overheating by cutting off heater power supply if the temperature rises over 150°C, and reoperating heater by connecting heater power supply if the temperature falls under 120°C.

• OPERATING TEMPERATURE

OPEN TEMPERATURE(OFF)	150°C ± 5°C
CLOSE TEMPERATURE(ON)	120°C ± 5°C

• PICTURE

✥ UNIT FAN MOTOR

function : circulating the inside air during dry process.

• SPEC

ITEMS		SPEC
RATING VOLTAGE		24V
RPM	MOTOR	3700 ± 10%
	DUCT FAN AS	1900 ± 10%
ROTAING DIRECTION		CW

• PICTURE

• FAILURE MODE : * E3 shown : FAN MOTOR cannot work.

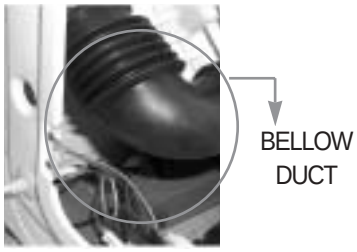
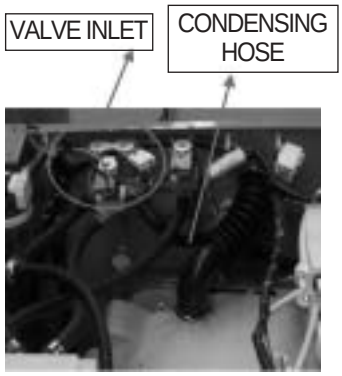
• CHECKING METHOD : Check the FAN MOTOR is short, and replace with new one.

6) LACK OF DRY PERFORMANCE

• Situation : after drying, the clothes still get wet.

cause) ☞ The laurdry amount is more than the recommendation capacity 7.0kg.
☞ Condensing cold water is not supplied.
☞ Clogging Bellows Duct results in poor air circulation.

checking method)

part name	checking point	checking results	jurge	repair method
BELLOWS DUCT		clogging bellows duct	heater was overheated owing to poor air circulation	clean the bellow duct
VALVE INLET +Condensing HOSE		no water supply from inlet valve	VALVE INLET connector slipped out	connect normally
			VALVE INLET broken	replace valve inlet
			ill-connection of condensing hose to duct pipe	connect normally

• Situation after drying, the clothes was soaked and hot.

cause) ☞ The dry is done from bad spin performance because of unbalance.
☞ no spin was done before the dry had started.

• Situation : PCB shows "H1" or "H3".

cause) ☞ Thermistor is broken.
☞ Thermistor is short or cut-off.

countermeasures) ☞ replace the Thermistor.

• Situation : PCB shows "H7".

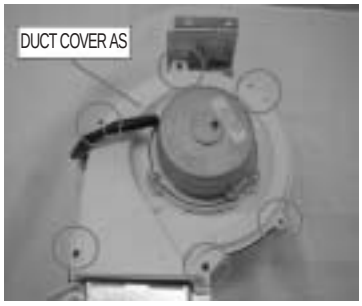
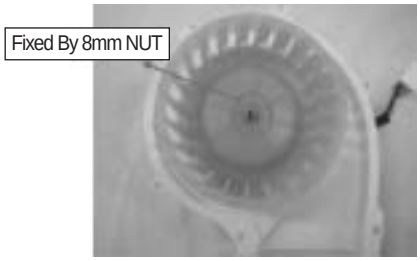
cause) ☛ Dry heater is cut-off.
☛ Fuse temp. is cut-off.

repaire method) ☛ replace the Dry heater.
☛ replace the Fuse temp.

checking point	part name	checking results	repaire method
	HEATER	dry Heater is short or cut-off.	replace the dry Heater.
	SENSOR TEMP.	Thermistor is short or cut-off.	replace the Thermistor.
	FUSE TEMP.	FUSE TEMPERATURE is cut-off.	replace the FUSE TEMPERATURE.

• situation : PCB shows "E3".

cause) ☞FAN MOTOR can not work.
countermeasures) ☞Replace the Fan Motor.

part name	checking results	repair method	disassemble process of Fan Motor
FAN MOTOR	fan motor failure	replace fan motor	① Disassemble Duct Cover As from Duct B As (Screw 4EA)  ② Disassemble FAN AS From Duct Cover As (Fixed by 8mm NUT)  ③ Disassemble the FAN MOTOR(SCREW 3EA)

Remarks) control times of each parts during dry process

parts	Control time
MOTOR	15 sec On, 5sec Off
DRAIN MOTOR	Continous working
FAN MOTOR	Continous working
DRY HEATER	95°C On, 105°C Off
INLET VALVE	30sec On, 5sec Off

Washing Heater Temp. Sensor Table

R25 : 11.981KΩ ± 4.04%
R80 : 1.704KΩ ± 3%
B25/100 : 3760K ± 1%

TEMP	MIN	NORMAL	MAX	TEMP	MIN	NORMAL	MAX	TEMP	MIN	NORMAL	MAX	TEMP	MIN	NORMAL	MAX
℃	KΩ	KΩ	KΩ	℃	KΩ	KΩ	KΩ	℃	KΩ	KΩ	KΩ	℃	KΩ	KΩ	KΩ
−40	282.914	298.650	314.387	0	34.352	35.975	37.599	40	6.403	6.653	6.903	81	1.603	1.653	1.703
−39	266.642	281.416	296.191	1	32.776	34.318	35.861	41	6.169	6.409	6.648	82	1.555	1.603	1.652
−38	251.432	265.311	279.190	2	31.284	32.749	34.214	42	5.946	6.176	6.405	83	1.508	1.556	1.603
−37	237.208	250.252	263.296	3	29.869	31.262	32.655	43	5.732	5.952	6.172	84	1.463	1.510	1.556
−36	223.900	236.165	248.430	4	28.528	29.852	31.177	44	5.527	5.738	5.949	85	1.419	1.464	1.509
−35	211.440	222.978	234.516	5	27.256	28.516	29.776	45	5.320	5.523	5.725	86	1.377	1.421	1.465
−34	199.683	210.537	221.392	6	26.044	27.242	28.440	46	5.131	5.325	5.518	87	1.336	1.379	1.422
−33	188.669	198.885	209.101	7	24.893	26.033	27.174	47	4.949	5.135	5.321	88	1.297	1.339	1.381
−32	178.347	187.967	197.587	8	23.801	24.887	25.972	48	4.774	4.953	5.131	89	1.259	1.300	1.342
−31	168.668	177.731	186.793	9	22.764	23.798	24.831	49	4.607	4.778	4.950	90	1.222	1.262	1.302
−30	159.588	168.129	176.670	10	21.780	22.764	23.748	50	4.443	4.608	4.772	91	1.186	1.226	1.265
−29	150.999	159.049	167.099	11	20.836	21.773	22.710	51	4.289	4.447	4.605	92	1.152	1.191	1.229
−28	142.937	150.527	158.117	12	19.939	20.832	21.725	52	4.141	4.292	4.444	93	1.119	1.157	1.194
−27	135.366	142.526	149.685	13	19.087	19.938	20.788	53	3.999	4.144	4.290	94	1.087	1.124	1.161
−26	128.253	135.009	141.766	14	18.277	19.088	19.899	54	3.862	4.002	4.142	95	1.057	1.093	1.129
−25	121.566	127.945	134.324	15	17.506	18.279	19.052	55	3.722	3.856	3.990	96	1.027	1.063	1.098
−24	115.230	121.252	127.274	16	16.770	17.507	18.244	56	3.595	3.723	3.852	97	0.999	1.033	1.067
−23	109.271	114.959	120.647	17	16.069	16.772	17.475	57	3.473	3.596	3.720	98	0.971	1.005	1.038
−22	103.665	109.039	114.413	18	15.402	16.072	16.743	58	3.355	3.474	3.593	99	0.944	0.977	1.010
−21	98.387	103.467	108.547	19	14.767	15.407	16.046	59	3.243	3.357	3.471	100	0.918	0.950	0.982
−20	93.416	98.220	103.024	20	14.162	14.773	15.383	60	3.133	3.243	3.353	101	0.893	0.924	0.955
−19	88.603	93.141	97.679	21	13.576	14.158	14.741	61	3.029	3.135	3.240	102	0.868	0.899	0.930
−18	84.072	88.361	92.649	22	13.018	13.574	14.130	62	2.929	3.030	3.132	103	0.845	0.875	0.905
−17	79.806	83.860	87.914	23	12.486	13.017	13.548	63	2.833	2.930	3.028	104	0.822	0.851	0.881
−16	75.788	79.622	83.456	24	11.980	12.487	12.993	64	2.740	2.834	2.928	105	0.799	0.827	0.856
−15	72.000	75.628	79.255	25	11.497	11.981	12.465	65	2.654	2.744	2.835	106	0.777	0.805	0.833
−14	68.408	71.840	75.272	26	11.037	11.499	11.962	66	2.569	2.656	2.743	107	0.756	0.784	0.811
−13	65.021	68.270	71.518	27	10.598	11.040	11.482	67	2.487	2.571	2.654	108	0.736	0.763	0.790
−12	61.825	64.902	67.978	28	10.179	10.601	11.024	68	2.408	2.489	2.569	109	0.716	0.743	0.769
−11	58.810	61.724	64.637	29	9.780	10.183	10.587	69	2.333	2.410	2.487	110	0.697	0.723	0.749
−10	55.963	58.724	61.485	30	9.400	9.786	10.172	70	2.258	2.332	2.407	111	0.679	0.704	0.729
−9	53.214	55.829	58.443	31	9.036	9.405	9.775	71	2.187	2.259	2.331	112	0.661	0.686	0.710
−8	50.620	53.097	55.573	32	8.688	9.042	9.395	72	2.119	2.188	2.257	113	0.644	0.668	0.692
−7	48.171	50.517	52.864	33	8.356	8.695	9.033	73	2.054	2.120	2.187	114	0.627	0.651	0.674
−6	45.857	48.081	50.305	34	8.039	8.363	8.686	74	1.991	2.055	2.119	115	0.610	0.634	0.657
−5	43.670	45.779	47.889	35	7.737	8.047	8.357	75	1.928	1.990	2.051	116	0.595	0.617	0.640
−4	41.594	43.594	45.594	36	7.448	7.744	8.041	76	1.869	1.928	1.988	117	0.579	0.602	0.624
−3	39.630	41.528	43.425	37	7.170	7.455	7.739	77	1.812	1.869	1.927	118	0.565	0.586	0.608
−2	37.773	39.574	41.375	38	6.905	7.178	7.450	78	1.758	1.813	1.868	119	0.550	0.572	0.593
−1	36.016	37.725	39.435	39	6.652	6.912	7.173	79	1.705	1.758	1.811	120	0.536	0.557	0.578

Day Heater Temp. Sensor Table

R40 : 26.065KΩ ± 3%
R100 : 3.3KΩ ± 11.1%
B40/100 : 4025K ± 2%

T(℃)	Rmin	Rcent	Rmax	T(℃)	Rmin	Rcent	Rmax	T(℃)	Rmin	Rcent	Rmax
0	142.55	162.21	184.12	56	12.980	14.066	15.203	112	2.211	2.343	2.477
1	135.55	154.09	174.72	57	12.520	13.557	14.643	113	2.149	2.279	2.411
2	128.93	146.41	165.85	58	12.078	13.069	14.105	114	2.090	2.217	2.347
3	122.68	139.17	157.48	59	11.655	12.601	13.591	115	2.032	2.158	2.285
4	116.76	132.32	149.59	60	11.248	12.153	13.097	116	1.977	2.100	2.225
5	111.17	125.86	142.13	61	10.857	11.722	12.624	117	1.923	2.043	2.166
6	105.87	119.74	135.09	62	10.483	11.309	12.171	118	1.870	1.989	2.110
7	100.86	113.96	128.45	63	10.123	10.913	11.736	119	1.820	1.936	2.055
8	96.12	108.50	122.16	64	9.777	10.533	11.319	120	1.771	1.885	2.002
9	91.62	103.32	116.22	65	9.445	10.168	10.919	121	1.723	1.836	1.950
10	87.37	98.43	110.61	66	9.125	9.817	10.535	122	1.678	1.788	1.900
11	83.33	93.79	105.30	67	8.818	9.481	10.167	123	1.633	1.741	1.852
12	79.51	89.40	100.27	68	8.524	9.157	9.813	124	1.590	1.696	1.805
13	75.88	85.24	95.51	69	8.240	8.846	9.474	125	1.548	1.652	1.759
14	72.44	81.30	91.01	70	7.967	8.548	9.148	126	1.508	1.610	1.715
15	69.17	77.56	86.74	71	7.705	8.261	8.834	127	1.468	1.569	1.672
16	66.07	74.01	82.70	72	7.452	7.985	8.533	128	1.430	1.529	1.630
17	63.13	70.65	78.87	73	7.210	7.719	8.244	129	1.393	1.490	1.590
18	60.34	67.46	75.24	74	6.976	7.464	7.966	130	1.357	1.453	1.550
19	57.68	64.43	71.80	75	6.751	7.218	7.699	131	1.323	1.416	1.512
20	55.16	61.56	68.53	76	6.534	6.982	7.442	132	1.289	1.381	1.475
21	52.76	58.83	65.43	77	6.326	6.755	7.195	133	1.256	1.346	1.439
22	50.48	56.24	62.49	78	6.125	6.536	6.957	134	1.225	1.313	1.404
23	48.31	53.77	59.70	79	5.931	6.325	6.729	135	1.194	1.281	1.370
24	46.25	51.43	57.05	80	5.745	6.123	6.509	136	1.164	1.249	1.337
25	44.28	49.20	54.53	81	5.565	5.927	6.297	137	1.135	1.219	1.305
26	42.41	47.08	52.13	82	5.392	5.739	6.093	138	1.107	1.189	1.274
27	40.63	45.07	49.86	83	5.225	5.558	5.897	139	1.080	1.160	1.244
28	38.94	43.15	47.69	84	5.064	5.383	5.708	140	1.053	1.132	1.215
29	37.32	41.32	45.64	85	4.909	5.215	5.526	141	1.027	1.105	1.186
30	35.78	39.58	43.68	86	4.759	5.053	5.351	142	1.002	1.079	1.158
31	34.31	37.93	41.82	87	4.615	4.896	5.182	143	0.978	1.053	1.131
32	32.91	36.35	40.04	88	4.476	4.746	5.019	144	0.954	1.028	1.105
33	31.58	34.85	38.36	89	4.341	4.600	4.862	145	0.931	1.004	1.080
34	30.31	33.41	36.75	90	4.212	4.460	4.711	146	0.909	0.980	1.055
35	29.09	32.05	35.22	91	4.086	4.325	4.566	147	0.887	0.958	1.031
36	27.93	30.75	33.76	92	3.965	4.194	4.425	148	0.866	0.935	1.007
37	26.83	29.50	32.37	93	3.849	4.068	4.289	149	0.846	0.914	0.984
38	25.77	28.32	31.04	94	3.736	3.947	4.159	150	0.826	0.893	0.962
39	24.76	27.19	29.77	95	3.627	3.829	4.033				
40	23.80	26.11	28.57	96	3.522	3.716	3.911				
41	22.87	25.07	27.42	97	3.420	3.606	3.793				
42	21.99	24.09	26.32	98	3.322	3.501	3.680				
43	21.15	23.15	25.27	99	3.227	3.399	3.571				
44	20.34	22.25	24.27	100	3.135	3.300	3.465				
45	19.57	21.39	23.31	101	3.043	3.205	3.367				
46	18.84	20.57	22.40	102	2.954	3.113	3.272				
47	18.13	19.78	21.53	103	2.867	3.024	3.180				
48	17.46	19.03	20.69	104	2.784	2.937	3.092				
49	16.81	18.31	19.90	105	2.704	2.854	3.006				
50	16.19	17.62	19.13	106	2.626	2.774	2.923				
51	15.60	16.96	18.40	107	2.551	2.696	2.842				
52	15.03	16.33	17.71	108	2.478	2.621	2.764				
53	14.48	15.73	17.04	109	2.408	2.548	2.689				
54	13.96	15.15	16.40	110	2.340	2.477	2.616				
55	13.46	14.60	15.79	111	2.274	2.409	2.546				

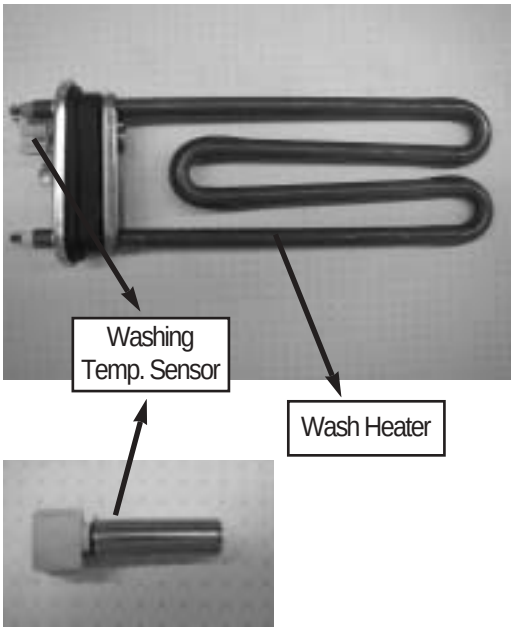
7. HEATER

1) Spec of Heater of Washing Machine

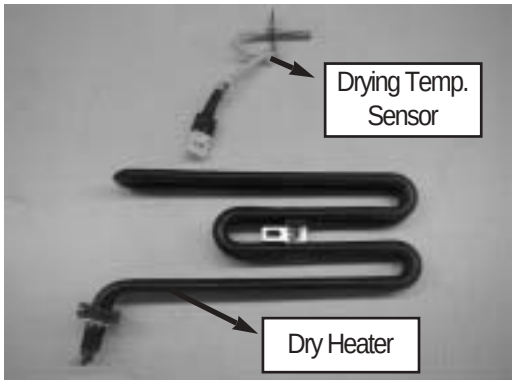
	WASH			
MAKER	IRCA	IRCA	IRCA	IRCA
RATED	220V	230V	130V	110V
CONSUMPTION POWER	2000W	2000W	1000W	1000W
PART CODE	3612802400	3612802410	3612802440	3612802430
	DRYER			
MAKER	IRCA	IRCA	IRCA	IRCA
RATED	220V	230V	120V	110V
CONSUMPTION POWER	2100W	2100W	1200W	1200W
PART CODE	3612800900	3612801400	3612802100	3612801300

Temp. Fuse of Washing Heater (184°C CUT OFF TYPE)
: Located inside heater to prevent fire, etc. caused by heating without water due to breakdown of water level sensor, etc.
: Cut-off in app. 1min in case of overheating, heater temp. of app. 270°C
: Washing heater must be used under water.

※Wash Heater



※Day Heater



2) Breakdown Diagnosis

Breakdown Symptoms	Cause	Diagnosis	Solution	PCB Error Mode
Washing water not heated (common for drum)	Wiring short	Check for short	Connect the cut-off part.	"H6"
	Washing heater or temp. fuse short	Check for short: Normal if 23.3~25.7ohm between both terminals of washing heater	Replace washing heater.	"H6"
	Connector/ terminal loosening	Check for loosening: Common for drum	Insert terminal.	"H6"
	Defect in washing heater temp. sensor	Measuring resistance between both terminals of sensor:	Replace temp. sensor.	"H2"
Overheating of washing water	Defect in washing heater temp. sensor	Measuring resistance between both terminals of sensor:	Replace temp. sensor.	"H2" or "H4"

Heater Replacement

*** How to Replace Washing Heater and Temp. Sensor**

1. Dismantling Connector

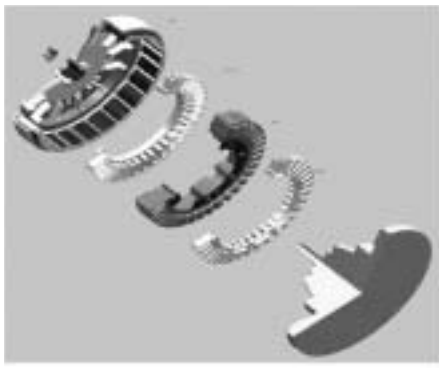
2. Loosening Earth and Heater Nuts

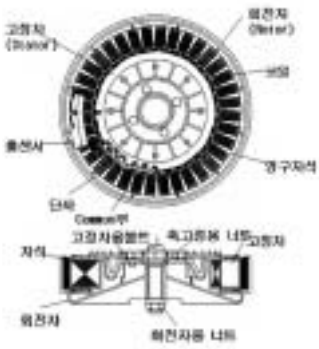
3. Replacing Heater and Temp. Sensor

4. Administer assembly in reverse order and make sure to fasten heater nuts first before the earth nuts.

7. HEATER

1) Structure of BLDC Motor





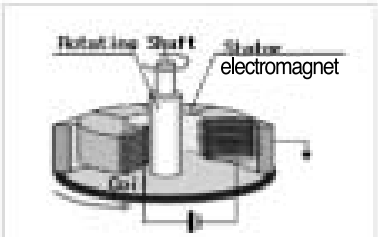
BLDC MOTOR

2) Power Transmission System of BLDC Motor

Sequence diagram of BLDC MOTOR

Drum

Motor

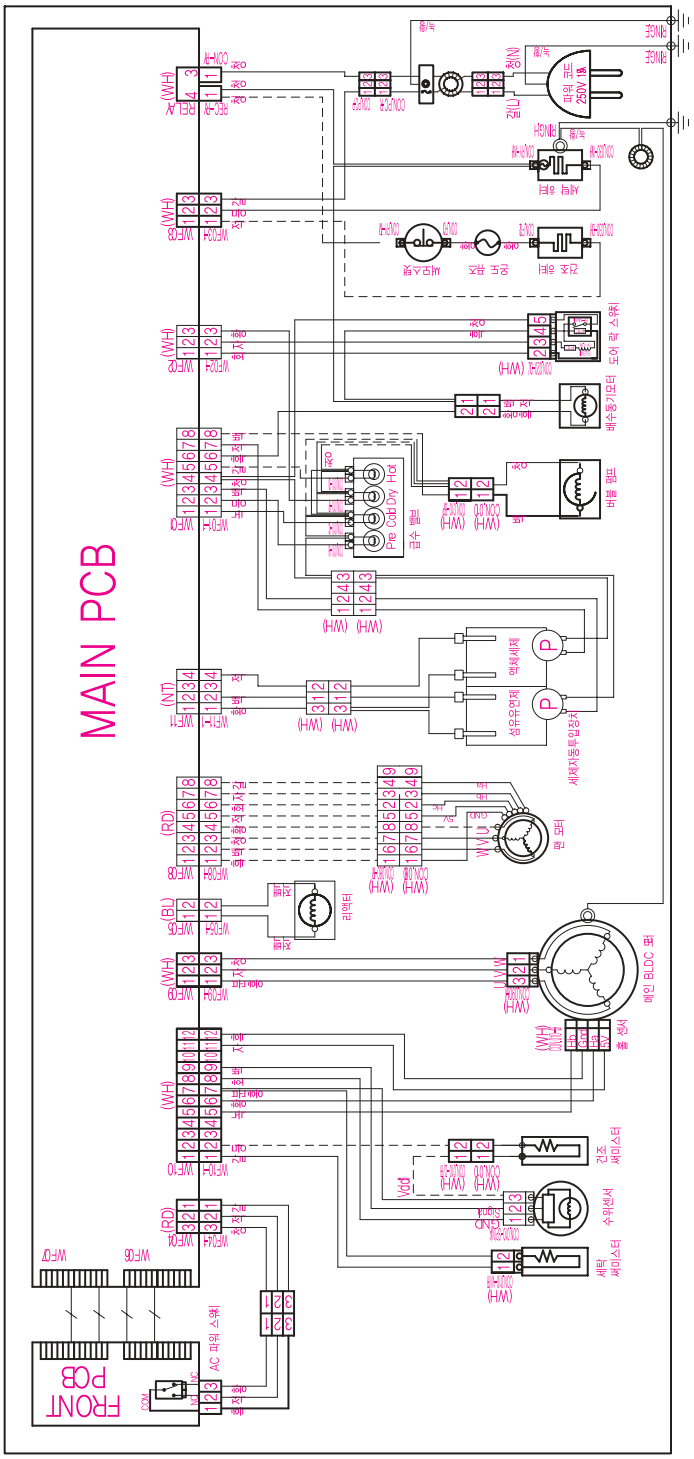


generating high power by rotator
(a permanent magnet) and stator
(multiple coils)

3) Specification

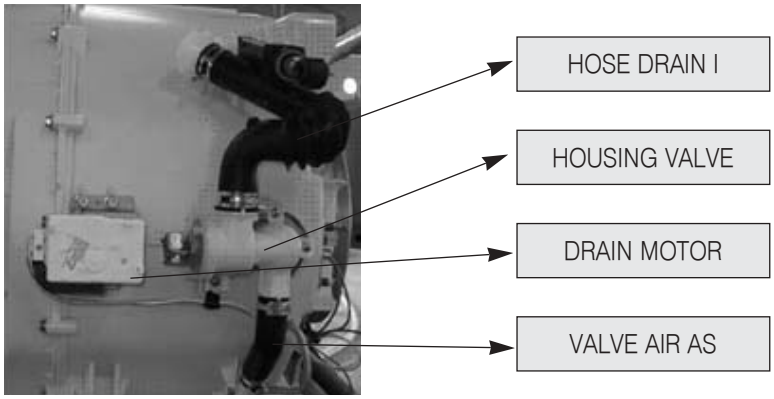
Classification	Item	BLDC : DD Motor
1. General	Rated Voltage	Vm = 310 [Vdc], Hall IC Voltage 5 [Vdc]
	Insulating Structure	Type B, insulator method
	External Appearance	Shaft connection and stator connection structure, Air-gap : 1mm
	No. of Poles	24 poles, Core: 36 slots, Layer: [30mm]
2. Performance	Consumption Power	390[W]±10[%], during washing (picked value)
	RPM	During Washing: 45RPM, During Spin-drying:1300RPM
	Output Characteristics	Torque: 300Kgf.cm (washing: 45rpm) Current: 1.5A (washing: 45rpm), 2.5A (spin-drying: 800rpm) AC Input Terminal - Washing: 250Wo, Spin-drying: 380Wo
3. Structure	Stator	ø265x30H
	Resistance	U(blue) - V(purple) : 13.8Ω±at 75°C] V(purple) - W(pink) : 13.8Ω±at 75°C] W(pink) - U(blue) : 13.8Ω±at 75°C] cf) Motor resistance at ambient temp. of 0 ~ 35°C 7.04 ~ 8.1Ω
	Rotor	Magnet : 24 segments, bracket, serration
	Hall IC	2-sensor Control Type, Top Central Angle: 7.5 degrees Signal Error Angle (phase difference): 90±5 degrees (based on electric angle)

8. WIRING DIAGRAM



9. TROUBLE SHOOTING REGARDING DRAIN

1) Structure of Dran Parts by TUB



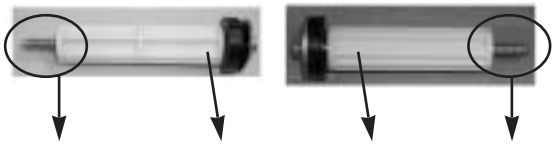
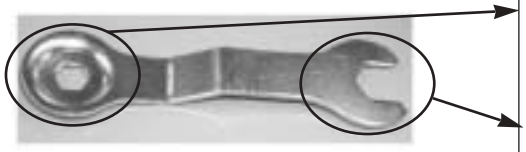
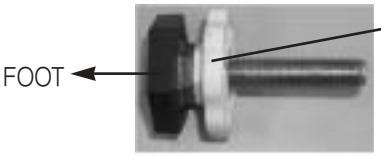
2) Checking Methods

• Situation : * "OE" is shown on PCB.
* Not finishing drain during 10 min.
* The water level can not reach to RESET POINT during 10 min of drain.

Checking Methods	Replacing methods
* Check the hose drain O condition; twisted or frozen.	* replace HOSE DRAIN O
* Check the hose drain O condition, blocked. * DRAIN MOTOR is broken.	* clean the inside of Filter. * replace DRAIN MOTOR

10. INSTALLATION GUIDE

1) Related Parts and Configuration

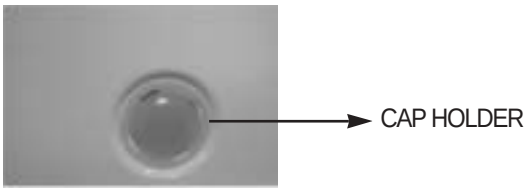
PARTS NAME	FIGURES	REMARKS
FIXTURE UP/DOWN AS		FIXTURE UP AS (3612008200) : L= 109mm FIXTURE DOWN AS (3612008300) : L=143mm
UNIT SERVICE WRENCH		① Remove Fixture UP/DOWN AS ② Adjust Leg
LEG ADJUST AS		

2) INSTALLATION PROCESS

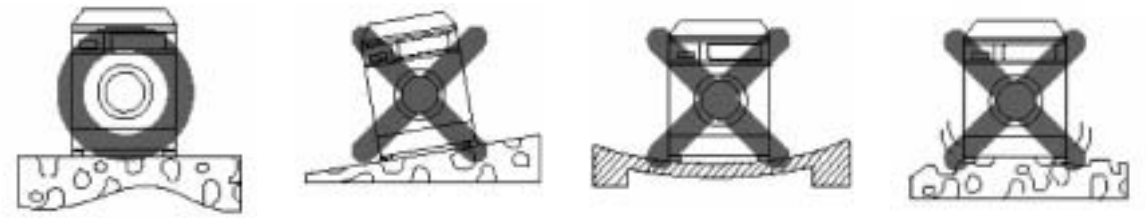
①Remove the FIXTURE UP/DOWN AS

Removal Method	Remarks
	☞ Disassemble the FIXTURE UP/DOWN AS by turning CCW direction. ☞ Please keep FIXTURE UP/DOWN AS for later use. ☞ When fixing FIXTURE UP/DOWN AS, turn it CW direction.

②Insert CAP HOLDER(4EA) after removing FIXTURE UP/DOWN AS.



③Please install the DRUM WASHING MACHINE properly on even and hard floor as below.



④Adjust the level of washer using LEG ADJUST AS.

Adjusting Method	Remarks
	☞ If turned CW, the LEG ADJUST AS moves the washer upward. ☞ If turned CCW, the LEG ADJUST AS moves the washer downward.

⑤After adjusting level, fix SPECIAL BOLT.

Adjusting Method	Remarks
	☆ Please fix the SPECIAL BOLT by rotating it CCW in order to prevent washer vibration.

11. ATTENTION POINT WITH SERVICING

No	Item	Part Name	Checking Point
1	Replacing Thermistor Dry	Thermistor Dry	Keep the Packing from seperating (Hold Packing when replacing) Keep the Packing from folding
2	Replacing Duct B As & Duct Pipe	DUCT B AS & DUCT PIPE	Check the sealing between Duct Pipe & Duct B AS
3	Replacing & Repairing Inlet Valve	Inlet Valve	Use only screw M4*8 for fixing Inlet Valve
4	Replacing Hose Drain	Hose Drain	Keep the sealing condition of Tub O tightly
5	Replacing HOSE A,B,C	HOSE A,B,C	Check the assembling order between INLET BOX & Hose A,C : Pre Wash-Cold
6	Replacing Heater Wash	Heater Wash	Unfastening the nut for fixing earth first then unfasten the nut for fixing heater
			At assembling the heater dry, check if the assembling condition between fixture heater is tight.(little gap on left & right)
			At fastening the nut for fixing the heater wash, keep the protrusion length of bolt to 10~12mm. (if under 10mm, water can leak, and if over 12mm, fixture heater can deform)
7	Replacing "Thermistor Wash"	Thermistor Wash	Unfasten the Nut for fixing heater, replace the thermistor, and fasten the nut for fixing heater
8	Assembling "Hinge Door"	Hinge Door	At fastening screw for fixing Door AS, be careful so that scratching at the related parts does not happen : If the scratching happens, it is possible to be claimed about appearance damage
9	(Dis)assembling "Door AS"	Door As	Be careful about the up/down direction of Door Glass : Keep the indication point of the part code downward.
10	(Dis)assembling "Motor AS"	MOTOR AS	To avoid the injury on the hand, grip the rim of the rotor At initiating the assembling operation of the stator, grip the stator and fasten the screw; at unfastening the screw, grip the stator so that it does not fall.
11	Damper AS	Damper AS	Fixed 4 Dampers with spring when assemble.

DW D-UD123X(S/M) 2010.3.4 4:44 PM 페이지74

DAEWOO ELECTRONICS CORP.
1-2, Jeo-dong 1(il)-ga, Jung-gu, Seoul, Korea
C.P.O. BOX 8003 SEOUL, KOREA
TELEX: DWELEC K28177-8
CABLE: “DAEWOOELEC”

S/M NO. :

PRINTED DATE: Mar. 2010

ABOUT THIS MANUAL

VISION CREATIVE, INC.
서울 종로구 통의동
6번지 이룸빌딩 4층

담 당	이영배 님		
MODEL	DWD-UD123X (S/M)		
접 수	2010.03.02 총 76페이지		
일 정	1차		
	2차		
	3차		
	4차		
	5차		
제 판	한	인 쇄	
규 격			

MEMO 총 76p
10.03.02-전체 신규 76p
10.03.04-11p, 17p, 21p, 31p, 33p 수정_ 신규 5p

연락처
VISION 담 당 방 문 수
TEL: 730-0660 FAX: 730-3788